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Teachers' Perceptions of Problem-Based Learning Task Design and their Understandings of their
Role in Implementation

By

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A dissertation submitted in partial fulfillment of the requirements for the degree of

Doctor of Education

Department of Education, Management, Leadership, and Policy

Seton Hall University

2020

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COLLEGE OF EDUCATION AND HUMAN SERVICES
SETON HALL UNIVERSITY

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ABSTRACT

Traditional classroom environments may not be providing enough opportunity to develop 21st-century learning skills and state policies have begun to suggest problem-based learning (PBL) as a solution; however, it is still unclear how these tasks are implemented into the classroom. Since teachers play such a paramount part in the implementation process the study's purpose is to explore teachers' perceptions of PBL task design and role in the PBL process. The study is a descriptive qualitative case study with six participants from urban Title I schools in NJ with PBL in the curriculum. The participants also were 6-8th grade language arts or social studies teachers. The study collected three data sources including a survey, lesson plan, and reflection. The study will be analyzed through Yin (2011) process of analysis and Action Theory Framework by Chris Argyris and Donald Shon, focusing on espoused theory and theory in use. The study explores how the how teachers' perceptions line up to their planned practice and the challenges teachers face with PBL implementation and discusses potential reasons for these challenges providing suggestions on future policy, practice, and research.

Key Words: problem-based learning, ill-structured, teacher perceptions, Action Theory, 21st-century learning skills, PBL implementation, PBL design

TABLE OF CONTENTS

ABSTRACT	iv
LIST OF FIGURES	vii
CHAPTER 1. INTRODUCTION	1
PBL and 21st-century Teaching and Learning.....	6
Problem Statement	9
Purpose Statement	11
Research Questions (RQs)	11
Terminology	11
Assumptions and Delimitations	12
Significance	16
Conclusion.....	18
CHAPTER 2. LITERATURE REVIEW	20
Background: Problem-Based Learning and Student Outcomes	20
Problem-Based Learning Versus Traditional Classroom Methods	22
PBL and Student Outcomes.....	25
Theoretical Framework: Action Theory.....	27
Espoused Theory	28
Theory in Use: Governing Values	29
Theories in Use: Action Strategy.....	30
Literature Review	31
PBL Design.....	32
Teacher Perceptions of and Role in Problem-Based Learning.....	35
Conclusion.....	39
CHAPTER 3. METHODS	42
Research Questions (RQs)	43
Methodology	43
Sampling Strategies and Participant Demographics.....	45
Methods: Data Analysis & Data Collection.....	46
Ensuring Rigor	49
Ethical Considerations.....	50
Statement of Positionality	51

CHAPTER 4. RESULTS	53
Themes	55
Theme 1: Facilitation has a Learning Curve	55
Questioning.....	57
Resources	58
Pacing Management	59
Challenges of Letting Go of a Teacher-Centered Classroom	60
Theme 2: Combatting Collaborative Conflict.....	61
Theme 3: The Project vs. Problem-Based Learning Dilemma.....	64
Theme 4: Time Concerns	66
Conclusion.....	67
CHAPTER 5. CONCLUSIONS	69
Summary of Findings	70
Discussion	76
Action Theory: What Theory Says and What Was Observed	76
Teachers' Perceptions of PBL Design.....	81
Teacher Perceptions of Role in Problem-Based Learning.....	84
Summary of Discussion	85
Implication for Policy.....	87
Implications for Practice	88
Implications for Research.....	93
Assumptions and Delimitations	96
Conclusion.....	100
REFERENCES	103
APPENDIX A. IRB APPROVAL FORM.....	110

LIST OF FIGURES

Figure 1. Theory in use.	31
Figure 2. Theory in use: The ideal PBL scenario	78
Figure 3. Theory in use: The participants' findings.....	79

CHAPTER 1

INTRODUCTION

As our society continues to grow and develop, schools should be preparing students to become active global citizens. As technology progresses, the world is constantly changing and being re-imagined, creating jobs that one may not have even thought to prepare for before, thus making it even more important to teach students 21st-century learning skills. Students need to develop skills to meet the challenges of a 21st-century global workplace. In order for students to be properly prepared to enter the workforce and become a responsible global citizen in today's changing society, they must be able to be critical thinkers, collaborators, creative, and communicative.

The development of 21st-century skills expands past just an understanding of subjects. Rather, it extends to teaching students how to adapt to newly presented challenges. Employers want students who can think, not just about a specific task but have the ability to think through problems and develop solutions. As society progresses, more jobs are becoming automated, supporting the idea that jobs that require less thinking now can possibly be completed by computers (Bessen, 2016). There are fewer and fewer opportunities for jobs that do not require 21st-century skills. As society continues to advance, schools should be preparing students to be creative, critical thinkers who can collaborate, and communicate which are skills that cannot be replaced by electronics.

Creativity is needed to develop solutions that have never been discovered before or in preparation for problems that may have never existed before. In addition, collaboration and communication are also emerging as prominent skills valued by employers. Companies want students who can think, collaborate, and combine their ideas to develop solutions (Brush, 2017).

As schools begin to shift their academic focus, traditional approaches to learning may not be providing enough opportunity for students to develop some of these important 21st-century skills, thus making problem-based learning a powerful tool to implement into schools.

Traditional classroom methods focus on one subject at a time, isolating concepts in instruction. Problem-based learning methods are a cross-curricular approach, supporting students to incorporate all their knowledge into the problem-solving activity, not just an isolated subject. When students engage in these types of activities, their knowledge becomes transferable because they can make connections between materials (Brush, 2017). Problem-based learning allows the freedom for students to explore their own interests within the scope of the problem, also impacting motivation and higher levels of thinking (Bagus, 2018; Wilder, 2015). Problem-based learning develops critical life skills such as collaboration, flexible knowledge, self-directed learning, and critical thinking (Brush, 2017; Loyens, 2008; Nargundkar, 2014). These are all skills that are valued in the 21st-century workforce.

It is vital that as our society changes and adapts that the school system adapts with it. If academics do not advance along with technology, students will be ill-prepared to enter the workforce and contribute as global citizens in our society. Education is meant to prepare students for success, both socially and academically. If schools do not begin to adapt to these changes and teach students skills, not subjects, students will not be successful as a 21st-century learner. Society needs creative thinkers, for it is the creative thinker that challenges social norms and creates change. If students are not given opportunities to explore their creativity, our world will not advance. The critical thinker is just as paramount as the creative learner, exploring ideas through observation, analysis, and reflection, making the creative elements more than just ideas, but considering how to turn these ideas into action. Regardless of the subject, if students are

taught and given the opportunity to think in these ways, schools are preparing students to make a big impact on our society in the future.

Educational policies emphasize these 21st-century y skills at both national and state levels, highlighting the importance of incorporating these skills into student learning. Although PBL is not mandated within these policies to teach 21st-century skills, PBL can be used to support 21st-century learning expectations. The National Education Association (NEA) is a founding member of the Partnership for 21st-century skills. This is a national organization that encourages schools to incorporate technology and infuse these important skills into school curricula (NEA Website). The National Education Association also references the “4 C’s” (critical thinking, collaboration, creativity, communication) as important skills for student achievement. The NEA has multiple resources providing support, guidance, and discussing the importance of infusing 21st-century skills into the workplace. The NEA provides a section that spotlights problem-based learning and provides specific resources highlighting introductory elements of problem-based learning as well as research, reviews, web sources, and how a PBL looks inside of a classroom (NEA, PBL Spotlight). Although policies do not mandate PBL use to teach these skills, this further highlights that problem-based learning is recognized as a key element in developing these skills for students, thus making it even more important to understand how problem-based learning is being implemented at a school level.

On a state level, The New Jersey Department of Education under the New Jersey Student Learning Standards: Standard 9, titled 21st-Century Life and Careers, specifically references communication and collaboration skills in preparation for the 21st-century workforce, directly connecting to problem-based learning student outcomes. It also refers to being able to plan, execute, and alter goals in accordance with societal and economic conditions, which also

connects to the problem-based learning design of a relatable real-world problem statement. Standard 9 highlights personal skills students should be developing, including self-reflection, adaptability, and proactiveness, connecting to problem-based learning outcomes of self-directed learning and personal motivation. The standard emphasizes students' preparation for the workforce, college readiness, and personal goals. The purpose is to not only prepare students to pass in school, but prepare students to be financially independent, acquire academic and life skills, and contribute to society (NJDOE, 2005; NJSLS Standard 9, 2020). State policy includes intended outcomes but does not provide specifics on how to achieve them. However, all these important components of the standards can be achieved within a problem-based learning task.

Part of the reason it is vital to teach students 21st-century skills is the continual growth and innovations seen in the technological field. It may be impossible to prepare students for careers that may not even have been created using traditional methods. Therefore, it is essential to equip them with the skills needed to meet these future challenges and achieve success. The New Jersey Department of Education recognizes the importance of teaching these technology skills and highlights them in the New Jersey Student Learning Standards under Technology Literacy Framework. A key phrase noted in the Technology Framework states curriculum integration should be "learner-centered" by increasing engagement and, therefore, student achievement. Learner-centered instruction is a core focus of problem-based pedagogy, switching from a traditional method to a teacher-centered approach. The literacy standards further indicate that students should be developing thinking skills that include gathering information and being able to organize, evaluate, make decisions, and solve problems. It also clearly states that students should work as a team to develop communication skills. Although it is not directly stated within

state policy that PBL should be used, the details outlined in this standard directly correlate with the design and intended outcomes of problem-based learning tasks in the classroom.

The New Jersey Department of Education further provides information on the importance of these skills with the New Jersey Cross-Content Workplace Readiness Curriculum Framework. The workplace readiness standards clearly specify critical thinking, decision-making, problem-solving, and self-management skills as a core focus of the standard, indicating these skills are essential to workplace readiness. These skills will span across multiple disciplines, including the arts, physical education, language arts, math, science, social studies, and world languages. These core skills are necessary to the foundation of “competent workers in a high-performance workplace” (NJDOE, 1996). The standards even have a section titled “PBL” and provides problem-based ways to include these skills across all disciplines. By supplying this section in the standards, it is clear that there is a correlation between the skills the state aims to achieve and how they plan to achieve these goals by utilizing the problem-based learning activities. Problem-based learning may be an essential component of the curriculum as a way to teach these valuable 21st-century work-related skills. If the state outlines not only the focus skills of the standard and even goes as far as to include PBL tasks as a solution, consideration must be given as to why schools are also not switching from traditional methods into a problem-based learning style to achieve these goals.

According to the New Jersey Department of Education Student Learning Standards, there are many common elements listed for students to achieve that relates to the 21st-century core learning elements of creativity, communication, collaboration, and critical thinking. Schools create a curriculum to follow these standards and have goals to develop critical thinking skills, claim to support creativity, and strive for communication and collaboration among students, but

yet many have failed to adapt their traditional methods to support these changes. Problem-based learning can be one strategy schools can incorporate to support state policy goals. When taking a closer look at the policies in the Student Learning Standards, there are multiple strands referencing the need for effective communication and collaboration in both written and verbal forms. According to Saptura (2019), critical thinking includes the ability to analyze, synthesize, evaluate, create, and summarize (p. 1080). The Student Learning Standards consistently use these terms within their strands, supporting that the strands encourage critical thinking. The standards for reading and writing ranging from 6–12 even go as far as to state, “To become college and career ready, students must grapple with works of exceptional craft and thought whose range extends across genres, cultures, and centuries” supporting the ideas of a cross-curricular approach as seen in problem-based learning tasks. (NJDOE, Student Learning Standards, 8th Grade LAL & High School 9 &10).

Each of these policies outlines specific goals for 21st-century learning that can be met by utilizing a problem-based learning task. Districts adopt curricula to meet state expectations for 21st-century learning skills; however, it is not mandated that they use PBL to do so. Although it is clear that policy has suggested PBL as a resource to help teach these valuable skills, schools have yet to switch from traditional approaches to support the changes. To properly prepare students to enter the workforce, more consideration needs to be given to curricular policy to ensure opportunities to develop key skills such as critical thinking, creativity, communication, and collaboration are available in the classroom.

PBL and 21st-century Teaching and Learning

Problem-based learning is one possible solution to addressing this complicated problem of providing students opportunities to develop these important 21st-century skills while also

giving students the freedom to expand and explore their own interests on these topics. A problem-based learning task is a pedagogical strategy that aims at increasing critical thinking, collaboration, creativity, and communication through a student-centered learning task (Brush, 2017; Hmelo-Silver, 2012; Thomas, 2000). A PBL also includes real-life problems that would correlate with real societal and economic conditions.

A key element of PBL tasks is communication and collaboration, and these skills are essential to student learning. Students who excel in creativity may struggle to think critically; therefore, the social element of communication and collaboration of their ideas creates even stronger solutions (Saputra, 2019). These 21st-century skills surpass any grade level, subject, or concept. These are life skills that students will value, no matter the context of their careers, becoming not only a great learner but developing social skills for their society (Brush, 2017). With the advancement of technology, accessing platforms to communicate and collaborate has become even easier. With proper guidance, students can be taught to maximize these opportunities and gain strategies to effectively communicate with their peers or even professionals. However, just having opportunities to communicate does not necessarily mean students are utilizing these platforms effectively. Problem-based learning can provide opportunities to practice effective communication and collaboration by utilizing teacher guidance, thus making it even more important for schools to implement problem-based learning to create effective change and advancement for students learning these valuable skills (Bagus, 2018; Torp & Sage, 2002).

Technology has created an abundance of knowledge available to students in a variety of subjects, levels, and topics; what an extreme disservice it is to allow students only to access specific assigned information in a class instead of allowing them the freedom to explore and

develop their own passion for learning, researching topics they find captivating, and developing research they believe is important. Many schools have created a system where students are forced to read the same articles and arrive at the same answers. This does not give students opportunities to explore their own innovative ideas, and therefore will never create change (Ahlquist, 2003). It is vital schools develop innovative thinkers to continue to progress our society forward. Elements of traditional classroom approaches do not support the skills needed for these changes, which is why it is a necessity to change the school curriculum to support student learning through PBL tasks.

If schools want students to become 21st-century learners, traditional classroom methods need to be changed to support these new skills and give students an opportunity to develop them. The main barrier that impedes successful problem-based learning implementation is shifting teaching from a traditional approach to a PBL design, allowing teachers to become facilitators as students direct their learning. This shift may be challenging for teachers, incorporating a completely different style of teaching and releasing the control of the room to be more student-directed (Brush, 2017). For teachers to become proper facilitators, there are many primer skills they will need to enable them to successfully facilitate a problem-based learning task in the classroom, including cross-curricular knowledge, class management, and motivators. The problem-based learning structure differs from traditional methods because it does not have a structured plan, in the sense that teachers may not be able to prepare for every moment that may come up in problem-based learning task because it would be difficult to see what direction students take their research (Brush, 2017; Thomas, 2000; Torp & Sage, 2002). This is a large shift in focus from traditional teaching styles. Developing understandings of teachers'

perceptions of PBL will contribute to understandings of how teachers are perceiving and, subsequently, acting upon this shift.

A more specific challenge related to the shift from a traditional classroom model to a problem-based learning design is the lack of understanding of the teacher's role in the process. If teachers do not have a solid understanding of what they are supposed to do to help the students, this will have a direct impact on implementation. Another challenge is the lack of understanding of what is included in the design of a problem-based learning task (Brush & Save, 2017). Teachers may be familiar with the term problem-based learning and may possibly have some understanding of what it entails. However, if teachers are not clear on how to design a problem-based learning task, this will directly impact implementation. To those points, deeper understandings of how teachers perceive PBL design and their role will provide further insight into how teachers are perceiving and responding to this shift, which may be used to better support the shift and implement PBL in a sustainable manner.

Problem Statement

In order to be properly prepared for the 21st-century workforce, students need to have a skill set that surpasses isolated academic subjects; students need skills that will be transferable in any career setting. The problem is that many traditional approaches do not provide ample opportunities to develop these skills. However, it is vital students develop these skills because as technology continues to progress, basic level jobs are becoming automated, thus utilizing fewer people in the workforce, meaning those jobs that require a person to complete them are jobs that require skills such as problem-solving and critical thinking. The 21st-century job market is looking for creative thinkers and those that can think through problems and create solutions,

solving societal problems, and helping it advance. If schools do not adapt to the changing workplace, students may be ill-prepared to attain and prosper in their careers.

Many traditional classrooms may not be providing opportunities to develop these essential skills; however, incorporating problem-based learning can provide schools a clear path to helping students achieve these vital 21st-century skills. Educational policies at both national and states levels are emerging to support this change; although policy suggests PBL as a strategy to implement 21st-century skills, it is not mandated. Therefore, it is unclear how it is implemented at a school level and whether or not schools are seeing any of the perceived outcomes from problem-based learning tasks. To gain a better sense of how effective problem-based learning is at a school level, it is important to understand the teachers' perceptions and understandings of PBL tasks, specifically in how they view the design and perceive its' implementation. Since teachers are the core implementers of PBL tasks, their perceptions will be vital to the successful outcomes of the PBL task.

Although schools may recognize the value of a problem-based learning task, shifting from traditional methods into a PBL centered teaching approach may be difficult. PBL learning shifts a teacher-driven classroom into a student-driven classroom requiring teachers to have primer skills in place before even beginning the implementation of a problem-based learning task. Although some general teaching skills will be present in both traditional and PBL centered classrooms, such as classroom management, PBL centered classrooms also require a new set of skills from teachers such as cross-curricular knowledge and facilitation. In addition, teachers cannot plan for PBL tasks since students drive the process and arrive at multiple outcomes. Teachers must be prepared to guide all of these groups to effectively implement PBL into the classrooms, thus, making the study even more important to an understanding of how teachers

view this process and how teachers perceive the PBL task design. If teachers do not have a solid understanding of their role in the process, the successful outcomes of a PBL task will not be present in the classroom.

Purpose Statement

The purpose of this study will be to explore teachers' perceptions of problem-based learning task design and their understandings of their role in relation to problem-based learning implementation. By utilizing action theory frameworks, the study will explore teachers' perceptions and implementation of PBL to illuminate how they are making sense of PBL design and their role; and, in turn, translating those understandings to practice.

Research Questions (RQs)

RQ1. How do teachers describe the design of a PBL task?

RQ2. How do teachers describe their role in the implementation of a PBL task?

RQ3. How are these perceptions of task and role reflected in practice?

Terminology

The following section defines keywords and phrases important to understand the study's purpose.

Problem-based learning or (PBL): Student-centered and driven, teacher facilitator, multidisciplinary, students learn through solving a problem (Hmelo-Silver, 2012; Milman & Kilbane, 2017; Thomas, 2000; Torp & Sage, 2000).

Project-based learning (PBL): Students produce a product instead of solving a problem (Milman & Kilbane, 2017; Thomas, 2000).

Traditional classroom: Teacher-centered delivery of instruction, lecture-based, focused on the content of one core subject (Torp & Sage 2002; Wilder, 2015; Wyness & Dalton, 2018).

Collaborative learning: Students utilize other students as a resource and work together (Dolmans et al., 2005; Kumar & Kogurt, 2006; Thomas, 2000).

Active learning: Students actively participate in their own learning and drive the learning (Dolman et al., 2005; Kumar & Kogurt, 2006; Torp & Sage, 2000).

Theory of action: A broad term to describe the connection between people's thoughts and theories and how these can affect practice or implementation, Theory of Action has two main components, including theory in use and espoused theory (Argyris & Schon, 1976).

Espoused theory: The belief of what a person thinks they will do in a certain situation based on what they perceive the consequence will be (Argyris & Shon, 1976).

Theory in use- is a concept of how espoused theory beliefs actually reflect in behavior (Argyris & Schon, 1976).

Assumptions and Delimitations

While careful consideration was given to understating the context, identifying the problem, and designing research questions that would yield insight into addressing the problem, all decisions have implications for how findings may be interpreted or applied in other settings or contexts. This section will identify some of the study's underlying assumptions, limitations, and delimitations in order to promote appropriate, fair, and ethical use of its findings.

There are numerous assumptions made in the conduction of this study. There is an assumption that teachers within the study teach under similar expectations or policies. Although the study seeks to narrow the pool of teacher participants, expectations for teachers can completely change from district to district. In addition, if schools have a curriculum in place that promotes problem-based learning, these expectations can look different from one district to another.

Because the sample is taken from teachers in district(s) that expect their teachers to implement PBL as a professional responsibility, there is also an assumption that teachers will know at least something about problem-based learning in general. However, it is possible they have never heard of it and have no information to share about it within the questionnaire. Practice will also be explored to provide insight into possible underlying beliefs and ideas that teachers do not explicitly share through other data collection methods. Similarly, there is an assumption that if the school has curricular expectations in place that teachers know about those expectations, which may not be true. Especially if problem-based learning is a new professional responsibility to the districts' curriculum, unless the district has made an effort to make teachers aware of the curriculum changes, there is no guarantee that teachers will be implementing PBL at all. This also adds an assumption that teachers, even if aware of PBL within the curriculum, have the proper time and resources to implement PBL into their classrooms. Teachers may be aware of the PBL curricular expectations and may also want to implement it. However, in order to implement it effectively, they may need time and resources. If they do not, this would greatly affect their decision in not only if they implement, but how they choose to implement the task. There is also an assumption that any teacher under the right conditions can implement a PBL.

Lastly, when collecting data in the forms of a questionnaire, there is an assumption that participants will answer truthfully and fully participate. In order to encourage participants to answer truthfully, all study data will be completely confidential. Data will have no association with the specific teacher or give information on the specific district. If the privacy of the participant is not considered, the participant may not feel comfortable answering honestly unless it can be ensured there are no negative ramifications for them in their districts, and participants may withdraw at any point in the study.

Limitations are also present in this study. Data collection will be in the form of a survey, lesson plan, and a reflection. A limitation would be the amount of information that teachers share when contributing to the three data collection sources. In addition, the time they invest in answering the survey or reflection with well-developed answers will also limit the study. Time also presents an added limitation because the study is taking place in a short time frame. The study will not be focusing on teachers' perceptions of PBL implementation over time but rather will be collecting data over a short time period. The data source of lesson plans may also present an additional limitation; lesson plans may not be a true reflection of what is being done in the classroom and could also greatly vary with different classes of students even with the same teacher. A lesson plan could also not include everything that was conducted during the duration of the lesson and could progress into something very different from what was originally planned. Considering these limitations, this study's findings will still present valuable insight into teachers' perceptions of PBL and how they implement it, which may be used in analyses to explore how well those perceptions align with PBL research-based practices, but their actual implementation in practice will not be explored.

A delimitation of the study is it will only focus on a small number of teachers with a sample of five teachers. The initial sample will focus on five teachers; however, the study will continue to collect data until it reaches saturation. Smaller sample sizes in qualitative research are appropriate as long as saturation is met as they provide a thick, rich description (Creswell, 2007; Creswell et al., 2007; Guest et al., 2006). In qualitative research, transferability is the application of findings to other similar situations. Qualitative information provides rich data, and therefore, details providing substantial information into understanding the phenomenon, thus making it more relevant. The information gathered from the data sources will be transferable to

other contexts that share similar characteristics as the sample criteria. Location is also a delimitation; the study will be conducted in New Jersey only, and it is possible other states have different mandates that may or may not support problem-based learning and yield completely different results. However, transferability in qualitative research focuses on a typical situation; in this case, problem-based learning in the classroom. Regardless of the state, problem-based learning may be occurring in the classroom. Therefore, given a similar situation, the findings may be applied across other similar scenarios (Slevin & Sines, 1999). In addition, the study will only focus on teachers in urban Title I schools, further narrowing the sample criteria. However, the findings may be relevant to other Title I schools in urban locations. Lastly, the sample will only be middle school teachers who teach language arts or social studies; however, the findings may be transferable to teachers in the same grade level regardless of subject or the same subject regardless of grade level given that it shares similar criteria in the findings. The framework presented in the study will also include delimitations. The Action Theory framework presented by Chris Argyris and Donald Schon is extensive. The study will only utilize a small portion of the overall work of these two researchers to yield results. The study will utilize the framework of espoused theory and theory in action but will not be utilizing other aspects of action theory framework such as single or double-loop learning.

The Action Theory framework appropriately suits the study's design. The Action Theory framework is divided into two main categories, including espoused theory and theory in action. This framework directly connects to what the study seeks to answer in the research question. Espoused theory connects to people's perceptions, directly correlating with descriptions of teacher perceptions. Theory in action relates to if people's idea of what they believe is actually what they do in practice. This correlates with the study because it seeks to understand if teacher

perceptions of what they think they know about PBL, is reflected in their actions in the classroom (Argyris & Schon, 1976).

Significance

The information from the study could yield data that may be helpful to improve state and district policies. More specifically, the study can specifically provide data that could make a difference at a district level by providing district guidelines as to how teachers' perceptions of problem-based learning may impact PBL implementation in their schools. Understanding how teachers view their role in the process can help districts make informed choices on the professional responsibilities they implement into their curriculum. These decisions can directly impact teacher training and professional development programs within the district, giving districts an idea of how frequently to have training or what specific aspects of PBL training are needed for their schools. By gaining an understanding of teachers' perceptions and how these perceptions reflect in their practice, districts can add, change, or remove curricular mandates after further consideration or the initial implementation of PBL, therefore, making appropriate changes as to what is best for their school.

The study will provide significant information because it is difficult to improve curriculum and practice if, at first, an understanding of teachers' perceptions cannot be identified. If teachers' perceptions of what is included in a problem-based learning task do not align with research-based criteria, this indicates a potential area that may need training to improve practice. Ensuring teachers have the knowledge base of what a problem-based learning task includes is vital to ensure effective implementation. The study may also have a great impact on teacher practice. If teachers have an understanding of problem-based learning that is misaligned to the research, this will affect their implementations' success. Identifying this gap

could be impactful for classroom teachers because if they do not know the best practice, there would be no need for them to change their practice unless it was noted it needed to be modified.

This study can also provide valuable information that may affect the curriculum. Many districts include a problem-based task in the curriculum to meet 21st-century learning expectations. Determining where and what teachers' understandings are of problem-based learning may actually stem from the district's understanding of problem-based learning, which could also affect the design of the task placed in the curriculum. If the district curriculum itself is presenting problem-based learning tasks that are misaligned with research best practices, this will also affect teachers' perceptions of what constitutes a well-crafted PBL. If more knowledge on what is considered a well-designed problem-based learning task is explored, it is possible the knowledge may lead to districts making changes to their actual curriculum. The study will not only identify what best practice in PBL looks like, but it will also outline specific criteria that can be applied to a PBL task, which can also be utilized along with teacher perceptions to make necessary curriculum changes. As more information emerges on problem-based learning and its outcomes, districts may begin to alter their curriculum. For example, if teachers are properly implementing the problem-based learning tasks, and it is yielding great results, it is possible that districts reconsider the time given to PBL instruction in class structures and schedules. This could lead to districts making possible changes to curriculum, class timing, or even adding problem-based learning as a full class experience.

There is an abundance of research that contributes to understanding problem-based learning and the valuable outcomes associated with PBL tasks. There are numerous studies that delve into the design of problem-based learning tasks and elements a PBL should include. There is also expansive research on the outcomes of PBL tasks, including both academic and social benefits.

However, limited research is available on teachers' perceptions and understandings of PBL tasks. There is also limited information on teachers' perceptions of how a PBL task should be implemented in the classroom. The study will add to the limited body of research focusing on the perceptions of teachers, specifically focusing on the understandings of what teachers perceive a PBL task to be and how they view its' implementation. Gaining an understanding of these perceptions will be helpful in making appropriate adjusts to PBL implementation.

Other researchers could expand upon this topic by utilizing the same design, but in a different state, gaining an understanding of teachers' perceptions are generally the same or if state regulations impact teacher perception. In addition, researchers could further study teachers' perceptions in rural or suburban areas and see if the perceptions correlate with those in an urban setting. Researchers could also explore teacher perceptions by grade levels, including an elementary or high-level focus group. In addition, consideration for further research could also be conducted in affluent school districts to compare findings. This could provide insight as to if PBL is more or less effective in at-risk districts or if results stay the same. Lastly, a more expansive study could be conducted, utilizing more participants to identify similarities between states or determine if teacher perceptions are generally the same overall.

Conclusion

In conclusion, this study's purpose aims to contribute additional information to what teachers' perceptions are of their role in the problem-based learning process. By gaining an understanding of what teachers perceive their role to be, knowledge can be gained on where there are many misconceptions in the process. If teachers' perceptions of their role differ from best practices, this will affect how they implement the problem-based learning assessment into the classroom. The study will highlight teachers' perceptions of what they consider to be a

problem-based learning design. By utilizing teachers' perceptions, we can identify what teachers' true understandings are on problem-based learning tasks because a lack of understanding of what is included in problem-based learning tasks could be a challenging and effective practice. By acknowledging where there may be gaps in the information process, steps can be taken to teach students these practices, which will then reflect on implementation.

The following chapters will further describe this study's design, findings, interpretations, and conclusions. Chapter 2 will further present a background to PBL, outline the theoretical framework of Action Theory to analyze teachers' understandings, and how their understandings are reflected in the classroom. The literature review will further explore research-based teacher perceptions of problem-based learning in the classroom and PBL best practices. Chapter 3 will present the study's methodology. Chapter 4 will discuss the findings of the study, including teachers' specific descriptions of their understandings of what a problem-based learning task is and how they describe it to play out in the classroom. Lastly, Chapter 5 will discuss the important findings in relation to existing scholarship and theory as well as implications for policy, practice, and research.

CHAPTER 2

LITERATURE REVIEW

Problem-based learning can provide valuable student outcomes, both academically and socially, in the classrooms (Brush 2017; Saptura, 2019; Thomas, 2000). Schools are beginning to incorporate aspects of problem-based learning into their curriculum to maximize student learning. However, simply adding problem-based learning into the curriculum does not guarantee its success. To address this issue, this chapter will give the background of how problem-based learning differs from a traditional classroom experience. It will also explore what student outcomes are seen in problem-based learning tasks. The chapter will present Chris Argyris and Donald Shon's Action Theory framework, specifically outlining the concepts of theory in use and espoused theory. It will also share reviewed literature on problem-based learning design and teachers' perceptions of problem-based learning. It concludes with a synthesis of understandings and their connection to the study.

Background: Problem-Based Learning and Student Outcomes

Problem-based learning has been well-documented in the past by its use in the medical fields. According to Strobel (2009), multiple case studies were conducted to determine the effectiveness of a PBL in preparation for the medical profession. A "traditional classroom" was defined as large in size, lecture driven, and teacher-facilitated. Findings consistently showed a traditional classroom approach was more effective for test scores and tasks. However, those involved in problem-based learning programs indicated higher retention, flexible knowledge, and a feeling of being better prepared for the field. Students in a traditional environment performed better on standardized tests and medical exams. However, when a follow-up exam was given, students were unable to produce the same results, while problem-based learning program

students retained the skills they learned years later (Dalton, 2018; Torp & Sage 2002; Wilder, 2015; Wyness, 2018)

This is part of the reason why the problem-based learning format is used so heavily in the medical field. Doctors are able to use problem-based scenarios and apply them to real-world cases. By utilizing problem-based activities, students develop problem-solving skills that are relatable to real life (Milman & Kilbane, 2017). PBL research argues that because of these relatable problems, students may be more intrinsically motivated because they can see the relatability of the actual problem or skill. Intrinsic motivation is incredibly important to student learning (Brush, 2017; Hmelo-Silver, 2012; Thomas, 2000). PBLs, by nature, are cross-curricular, providing students with many lenses to view a problem, not just focusing on one subject to view a problem (Wilder, 2015). Students choose their own method to create meaning of the problem regardless of the subject. Therefore, many solutions can be possible, and ideas from different subject areas are integrated instead of isolated (Torp & Sage, 2002). By allowing students the freedom to explore their ideas, students may stay more motivated on the task. For problem-based learning tasks, there is not a single right answer, which is also important when engaging students. Students are more likely to show interest in activities when they feel they can succeed. Not forcing students to think in only a logical or linguist manner gives them the opportunity to express their approaches to problem-solving in any manner they choose, supporting creativity (Brush, 2017; Hmelo-Silver, 2012).

As evidenced in problem-based learning's use in medical fields, the addition of problem-based learning into K-12 educational curricula have also become popular because of the perceived benefits from the task. For problem-based learning, these benefits are not only academic by supporting creativity, critical thinking, and flexible knowledge but also provide

valuable social aspects to student outcomes, including communication, collaboration, and self-directed learning skills (Brush, 2017; Hmelo-Silver, 2012; Saputra, 2019). To understand the translation of PBL implementation from medical settings to educational settings, it is first important to understand how PBL differs from traditional classroom methods and what student outcomes are anticipated from PBL implementation.

Problem-Based Learning Versus Traditional Classroom Methods

Literature defines a traditional classroom in four key ways. A traditional classroom has a competitive grading scale. A traditional grading scale uses specific numbers, noting that the higher number is the better number. On this scale, there will always be a top achiever and a bottom achiever. Traditional grading also focuses on specific answers or one correct answer (Saptura, 2019; Wilder, 2015). Additionally, traditional classrooms are teacher-led, typically delivering information in the form of a lecture (Dolmans et al., 2005; Strobel, 2009; Thomas, 2000). Next, traditional classrooms isolate one subject, teaching material that only pertains to that particular subject within the class period (Belland et al., 2006; Torp & Sage, 2002). Lastly, a key element of a traditional classroom is it has structured questions, meaning specific guidelines, directions, and rubrics are given to students to use during instruction. Structured tasks will produce products with similar elements or structures (Brush, 2017; Strobel, 2009; Walker, 2015). However, problem-based learning differs from these traditional classroom methods in four key ways; it is student-driven, teacher-facilitated, ill-structured, and cross-curricular (Brush, 2017; Thomas, 2000).

First, a problem-based learning task is student-driven. Students are able to explore the topic in any way they choose. Students control their learning and are given the freedom to explore the topic in any method they choose within the scope of the problem (Thomas, 2000;

Torp & Sage, 2002). Students are permitted to explore elements of the proposed problem they find interesting, then discuss and collaborate. This forces students to re-think their ideas and consider new perspectives (Bagus, 2018; Brush, 2017; Saputra, 2019). Student-driven tasks have shown valuable student outcomes such as higher retention, intrinsic motivation, and a higher level of transferable skills (Brush, 2017; Kumar & Kogurt, 2006; Strobel, 2009; Wilder, 2015). When compared to a traditional teacher-led classroom, a student-driven classroom will explore many different concepts, and groups may arrive at completely different outcomes (Bagus, 2018; Saputra, 2019).

Second, in a PBL task, teachers become facilitators. The teacher role is very different in a PBL centered classroom versus a traditional classroom. Teachers no longer drive the process; instead, teachers ensure the process continues effectively. Teachers give students guidance in their research by providing probing questions needed to drive their learning forward to reach the next level of their project (Kumar & Kogurt, 2006; Strobel, 2009; Torp & Sage, 2002). To become effective facilitators, teachers need strong skills in scaffolding to address the needs of all the students throughout their personal inquiry. In a problem-based learning task, teachers also need a wide range of cross-curricular knowledge to effectively probe, question, and challenge students to discover their own solutions (Dolmans et al., 2005; Lunyk-Child, 2001; Thomas, 2000; Torp & Sage, 2002).

Next, in problem-based learning, the problem statement will be ill-structured, meaning the criteria for the final product will not be specifically outlined in PBL task directions, directly contrasting with the prescribed nature of traditional classroom instruction, which outlines directions, provides questions, or gives specific grading rubrics (Brush, 2017; Thomas, 2000). Ill-structured problems force students to think critically, utilizing skills of analysis, synthesis,

evaluation, and creativity. The problem will relate to real-life situations or events, thus making it more relatable to the students (Dolmans et al., 2005; Saptura 2019; Thomas, 2000; Walker, 2015). In a traditional classroom, a structured teacher-driven model gives little opportunity for critical thinking. Assessment methods in a traditional approach tend to focus heavily on recall, memorization, and specific answers, whereas the ill-structured nature of a problem-based learning task has multiple answers that could all be correct, impacting student motivation and retention (Krentler, 1994; Kumar & Kogurt, 2006; Marzano & Costa, 1988; Strobel, 2009).

Lastly, problem-based learning is cross-curricular. Due to the elements of an ill-structured question and student-driven method, students are not isolated in what subjects they can use to solve the problem and instead pull from multiple disciplines and combine the knowledge to generate a solution (Brush, 2017; Thomas, 2000). Cross-curricular knowledge is vital to students being able to transfer these skills into other areas, including 21st-century careers. The knowledge is no longer subject related but instead applicable in many social and academic facets. A cross-curricular approach provides students with many lenses to view a problem, not just focusing on one subject to view a problem. Students choose their own method to create meaning of the problem regardless of the subject. Therefore, many solutions can be possible, and ideas from different subject areas are integrated instead of isolated (Brush, 2017; Torp & Sage, 2002; Wilder, 2015).

These key differences are why problem-based learning is gaining popularity in schools because it provides opportunities for learning that may not be available with traditional classroom methods. As technology and science evolve, research continues to provide information on learning strategies, shifting the paradigm of education from the traditional sense to accepting that students learn differently and content should be available in multiple forms to

support authentic learning (Hmelo-Silver, 2012; McKensie, 2012; Torp & Sage, 2002). PBLs can be an effective tool because of the way it adapts to different students' learning styles and, therefore, begins to explain why students may feel more motivated. Garner's theory of multiple intelligences highlights the variety of ways students can learn, including spatial, linguistic, logical, kinesthetic, rhythmic, interpersonal, intrapersonal, naturalist, and existential. Few of the intelligences are actually highlighted in school. The main foci in traditional classrooms tend to lean heavily on linguistic and logical approaches, thus making students who may learn differently struggle to achieve good grades. However, PBL learning provides enough flexibility in how students can conduct their projects so that they can utilize these different methods of learning and generate work that supports their learning style. Classrooms that reward students for critical thinking and deep thought are more intrinsically motivating and rewarding than utilizing traditional one correct answer scoring methods (Dolmans et al., 2005; Hmelo-Silver, 2012; Milman & Kilbane, 2017; Thomas, 2000).

PBL and Student Outcomes

Problem-based learning is credited with many different valuable student outcomes, including increased motivation, collaboration, and long-term retention (Belland et al., 2006; Hmelo-Silver, 2004; Thomas, 2000). Studies have also indicated other positive aspects of PBL learning, such as increased researching skills and text analysis (Wyness & Dalton, 2018). However, research suggests that outcomes may even surpass academics and positively impact discipline and attendance due to a high level of engagement in the classroom (Bijsman & Schakel, 2018; Tory & Sage, 2007). Although all of these outcomes are important, there are three major outcomes of problem-based learning tasks that influence student learning, which is the development of critical thinking, flexible knowledge, self-directed learning skills. These

three outcomes can greatly impact student achievement and their success as a 21st-century learner.

The development of critical thinking is the first major outcome of problem-based learning. Problem-based learning design supports this due to the ill-structured question design, allowing students to formulate their own ideas and inadvertently forcing them to think critically to solve the problem (Brush, 2017; Thomas, 2000). Providing opportunities for critical thinking can be challenging, but this type of thinking is what should be encouraged in the classroom. Critical thinking includes the ability to analyze, synthesize, evaluate, create, and summarize. Problem-based learning can positively impact students' critical thinking abilities, providing these missing opportunities. Critical thinking is an important 21st-century skill that students will value; employers seek out employees that can think through problems and create solutions. A key element to the development of this skill is the collaboration component of a PBL task, requiring students not only to consider their own ideas but also to incorporate their ideas with those in their group. Students collaborate and analyze the facts they are presented with and generate what they already know about the situation. This activates prior knowledge and encourages critical thinking (Bagus, 2018; Kumar & Kogurt, 2006; Mergandoller & Nargundkar, 2014; Saputra, 2019; Sockalingam, 2012; Thomas, 2000).

A major outcome of problem-based learning is flexible knowledge. Problem-based learning design supports this due to the cross-curricular component of the task; students can utilize information in any subject area; therefore, the knowledge generated from the task will be applicable in many formats. It is also supported in the design. By utilizing a real-life problem, students are able to connect to the proposed problem and incorporate all their knowledge, thus generating an outcome of information that can be used in multiple disciplines. When students

activate prior knowledge, collaborate, and make connections, it enables them to process new information and create new understandings. When knowledge is presented to students in this format, it becomes easily accessible and can be applied in real-world scenarios making it flexible (Brush, 2017; Dolmans et al., 2005; Hmelo-Silver, 2012; Kumar & Kogurt, 2006; Mergendollar, 2018).

The last major outcome of problem-based learning is self-directed learning skills. The design of problem-based learning tasks supports these skills because, in PBL tasks, students take charge of their own learning. Self-directed learning can be a good indicator of academic performance and includes tasks such as goal-setting, self-assessments, and self-monitoring. In a PBL task, this could manifest in the form of students researching the problem, collaborating, making choices, and recognizing the need to refine and redefine their own thoughts on the problem's solution. Collaboration plays a key role in the self-directed learning process because students create their own meaning in the PBL process and make their own decisions, exploring multiple paths in their inquiry. Self-directed learning also incorporates self-evaluation methods, which is important because it utilizes skills of thoughtful reflection (Dolmans et al., 2005; Kumar & Kogurt, 2006; Loyens, 2008; Lunyk-Child, 2001; Sockalingham, 2012 Torp & Sage, 2002). These documented student outcomes are dependent on the quality of PBL implementation. Since the implementation is theoretically associated with teachers' beliefs, it's important to understand teachers' perceptions of PBL design and their role in implementing a PBL task.

Theoretical Framework: Action Theory

The ability to put thought into action is an important one, especially in terms of implementing educational reforms. If schools are to shift their educational paradigm from a traditional school setting into a problem-based setting, there needs to be in place a way to

measure if the implementation was a success. After establishing the theories, it is vital to be able to measure if these theories are actually reflected in practice. To explore teachers' thoughts in relation to action, this study utilized a framework based on the novel *Theory in Practice: Increasing Professional Effectiveness* by Chris Argyris and Donald Schon and, more specifically, it will focus on espoused theory in action and theory in use.

To begin, Argyris and Shon (1976) discussed the disconnect people see in their own practice. This notion will be valuable to analyze since the study seeks to find the perceptions of problem-based learning from teachers' perspectives and determine if there is truly a connection between their actions and the problem-based learning criteria. Argyris and Shon's Theories of Action are divided into two main components: espoused theory and theory in use. Espoused theories are theories we know about ourselves, while theories in use are implied by our behavior (Dick & Dalmau, 2000, p. 5). The following subsections further describe the two components of action theory, espoused and theories-in use, and explain their connection to this study's purpose.

Espoused Theory

According to the espoused theory of action, people believe in a course of action and know what actions need to be taken to achieve a certain consequence. Espoused theory can also be the recognition of these actions; the person can conclude what they think they should do based on what they think the outcome should be. This correlates with the idea of forming a hypothesis in science; a belief is created based on prior knowledge of the consequences of a certain action (Argyris & Schon, 1976). Espoused Theory encompasses general assumptions about behavior. The study will seek to understand how teachers perceive certain actions in the classroom and how these actions will produce certain consequences. This concept could play a role in the choices teachers make in PBL design or implementation.

Understanding what teachers believe is their espoused theories will be valuable. However, to truly understand the impact of action theory, we must take a closer look at the theory in use. Theory in use encompasses elements including governing values, action strategy, consequences, and action strategy effectiveness. Understanding how these key elements interact will play a key role in understanding human behavior and, therefore, teachers' behaviors. Theory in action or theory are not concepts that people can generally apply on their own. It is a concept they do not consciously realize they are doing, but instead must be observed and inferred by their actions. There is a difference between your actual behavior and what you infer of your behavior. There is a difference between what you actually did versus what you said you were going to do (Dick & Dalmau, 2000, p. 11). There is only one way to determine theory in use, which would be through teacher observations of behavior. If through observation, the study can identify a gap in the espoused theory versus the theory in use, the study will gain an understanding of how to properly implement PBL instruction to maximize student achievement (Argyris & Schon, 1976).

Theory in Use: Governing Values

Governing values is one of the components of theory in use. However, governing values itself encompasses several components important to understanding human behavior, including goal setting, winning or losing, suppressing negativity, or rationality. People have governing values that typically drive their actions, such as goal setting. When people set a goal, the desire to reach that goal can have an impact on their behavior. Thus, identifying teachers' goals can provide insight into their classroom instruction. If the problem-based learning is not the core goal of instruction, there may be a connection to the actions of the teacher in the implementation process (Dick & Dalmau, 2000).

Another governing value is the concept of winning or losing. In general people want to win. Therefore, the desire to win may drive their actions in a certain manner. In terms of teacher practice, this may play into a factor of “what is in it for me?” with teachers, if teachers feel that implementation does not result in a “win” for them, but instead more work, they may not be implementing the PBL to the best of their ability (Argyris & Schon, 1976).

Another governing value is the concept of suppressing negative feelings. To highlight this concept, consider the idea of winning and losing. In terms of espoused theory, we may view ourselves as a positive person and consider ourselves to be supportive of other winners. However, in reality, that may not be how we actually feel and therefore try to suppress it. Thus, understanding if teachers view PBLs with positive or negative feelings may be used to further analyze their behavior (Argyris & Schon, 1976).

Lastly, when considering governing values, the concept of rationality also plays a role. People want to appear they are rational and predictive in their behavior. People want to at least appear to be rational, even if their thoughts are not consistent with rationality. Rationality may play a role in the study because teachers will want to appear “rational” to their district and may suppress their true feeling on the incorporation of a PBL into the curriculum. If the PBL is a mandate, they may suppress their true feelings on its’ effectiveness (Argyris & Schon, 1976). Considering all these points, understanding teachers’ governing values may provide valuable information about their potential, subsequent action.

Theories in Use: Action Strategy

The next component of theory in use is an action strategy. Action strategies are a series of actions in different situations that satisfy the governing values. Action strategy is behavior in which we manage our immediate surroundings, especially with the emphasis on our social

surroundings (Dick & Dalmau, 2000, p. 2). The action that stems from the governing principle is seen in an action strategy. An action strategy, then, may be viewed as the series of choices teachers make in the classroom when implementing problem-based learning. By examining those small choices, the extent to which they line up with teachers' governing value or their initial perception of what they considered to be PBL best practice may be examined (Argyris & Schon, 1976).

See Figure 1 for an illustration of this theory in relation to this study.

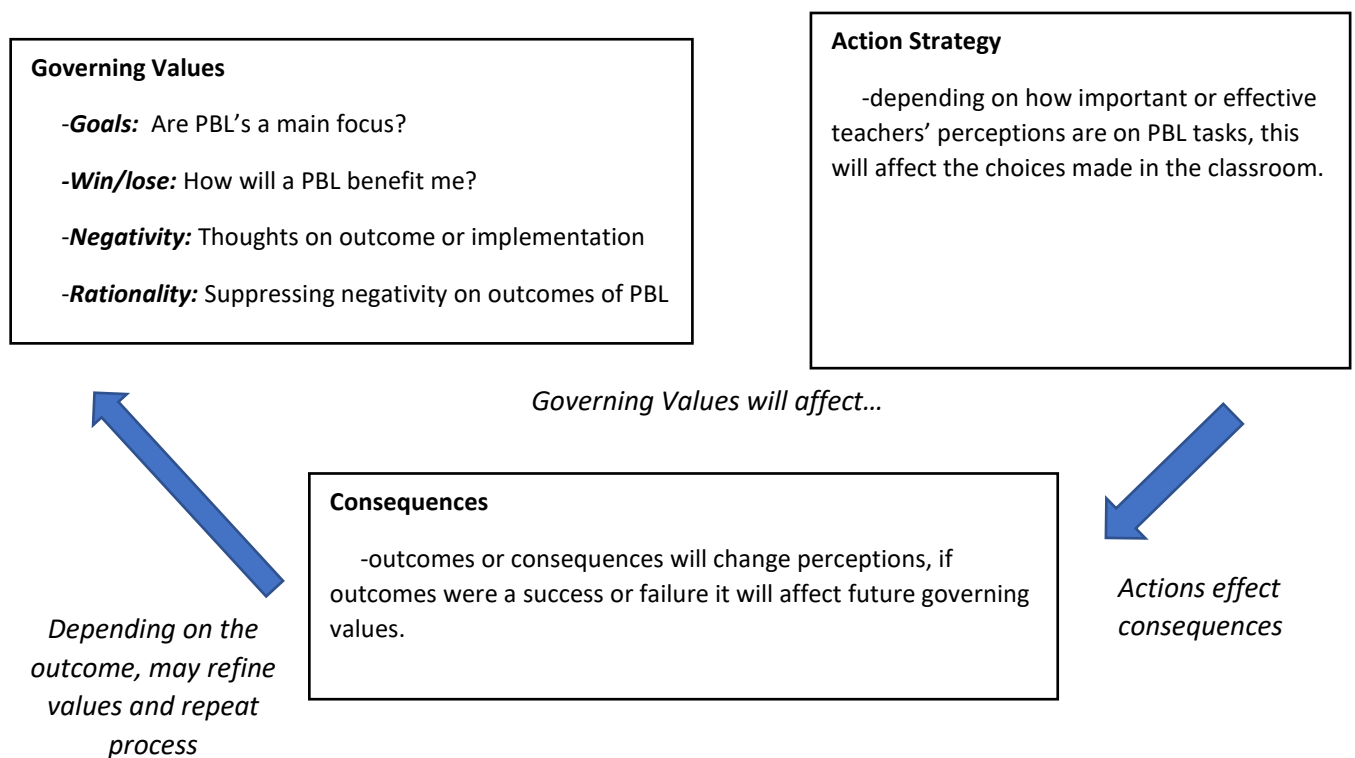


Figure 1. Theory in use. Theoretical concepts used were adapted from Argyris & Schon, 1976.

Literature Review

Although research is still emerging on problem-based learning outcomes, there is evidence to show that PBL's can provide students with academic and social opportunities that may not be available in the traditional classroom (Kumar & Kogurt, 2006; Strobel, 2009;

Thomas, 2000; Torp & Sage, 2002). A problem-based learning task is designed in a manner that supports all types of learners. The following section will outline the main criteria essential to developing and designing a problem-based learning task. In addition, it will outline teachers' perceptions of problem-based learning. In particular, the concept of teachers' role in implementing PBL will be discussed since teachers are essential to problem-based learning activities

PBL Design

There is an abundance of research available on structural elements and components of problem-based learning tasks. However, although there is a lot of research available on PBL, there are no specific criteria for what a problem-based learning activity should look like, and therefore, there is a lot of diversity when defining specific features of problem-based learning tasks. Due to the lack of a universally accepted model, much of the research varies in the development and activities available for problem-based learning tasks. In *A Review of Research on Problem-Based Learning*, John W. Thomas Ph.D. outlines five main criteria essential to a PBL assignment, including centrality, driving question, constructive investigation, autonomy, and realism (Thomas, 2000). However, these essential components, as defined by Thomas, can be further simplified into three key PBL structural components; a real-world problem statement, a collaborative investigation, and a synthesis of student ideas to address the problem (Kumar & Kogurt, 2006; Mergendoller n.d.; Thomas, 2000; Torp & Sage, 2000).

The first element of a basic problem-based learning task's structure is the presentation of a real-world, relatable problem, connecting to the "realism" and "driving questions" criteria outlined by Thomas. This means the problem is authentic, not a school created a problem for the sake of the assignment, but a true relatable problem in the world or in that particular school's

community (Thomas 2000). When considering the proposal of a real-world problem, it is important to consider the student demographics and specific location of the school; problem research can include looking in local newspapers or speaking with community members to ensure proper selection. Well-researched solutions could have the potential to be implemented since “real” solutions are not yet officially known or stated. However, in addition to the consideration of real-world factors, the questions must also incorporate the school’s curriculum, “driving” students to the core concepts required in the curriculum in addition to making the problem realistic (Belland et al., 2006; Kumar & Kogurt, 2006; Thomas, 2000; Torp & Sage, 2000). This further connects with Thomas’ (2000) criteria of centrality, which states that all PBL tasks should remain in the curriculum themes and not in themes outside of the curriculum. If a PBL is outside of the curriculum it would be considered an enrichment project and, therefore, not the driving factor of the curriculum (Thomas, 2000; Walker, 2015).

A real-world question will be ill-structured and include multiple disciplines, connecting to Thomas’ criteria of a driving question (Thomas, 2000). The purpose of proposing a real-world problem or a driving question is to keep the PBL relatable to students. If consideration of these factors is not given, it may reduce the effectiveness of the problem statement. Real-world questions are vital to maintaining student motivation helping them create an emotional connection to the problem and generate student learning. However, it is important that the question also drives forward the concepts required in a schools’ curriculum, thus making the problem selection a vital component to the PBL structure (Belland et al., 2006; Kumar & Kogurt, 2006; Thomas, 2000; Torp & Sage, 2000).

The second element essential to problem-based learning structure is a collaborative investigation. Students collaborate and analyze the facts they are presented with and generate

what they already know about the situation; this activates prior knowledge and encourages critical thinking. Thomas calls this process “constructive investigation”. Utilizing the word “constructive” is an important distinction: Just because students are collaborating does not necessarily make it constructive. To effectively or constructively engage in meaningful collaboration, all students must participate and determine what they know, share what they know with others, discuss their ideas to determine research “gaps,” conduct research, then combine their knowledge to create a plan to address the initial problem. When Thomas (2000) defined constructive investigation, he stated that this is a transformation of knowledge and development of new skills or understandings, which is why identifying these gaps within collaborative groups is so important. This element of collaboration is what makes a PBL a constructive learning approach. When students identify gaps, they are specifically targeting aspects of the problem they have not learned, thus promoting high levels of student learning and engagement. If a constructive, collaborative approach is attained, it can also help at-risk students stay motivated and combine efforts with stronger academic students (Belland et al., 2006; Dolman et al., 2005; Kumar & Kogurt, 2006).

In a constructive collaborative investigation, the teacher acts as a facilitator, ensuring students stay on task, pointing them in the right direction, or possibly providing information that may help students fill the student identified gaps in their learning process. The concept of teacher facilitation further connects with Thomas’ (2000) criteria of student autonomy. Thomas specifically defines “student autonomy” by stating the problem-based learning activity is student-driven and not teacher-led. There is no specific direction or a pre-determined outcome. As part of student autonomy, students are given choices, unsupervised work time, and responsibility. Thus, further contributing to the aspect of a constructive collaborative

investigation as an essential part of PBL structure (Belland et al., 2006; Dolman et al., 2005; Kumar & Kogurt, 2006).

The last key element of a problem-based learning structure is the synthesis of student ideas to generate a solution. At this point in the process, students combine their prior knowledge, collaborated knowledge, and researched knowledge into a developed plan to address the original presented problem. Each part of the PBL process plays an important role in the effectiveness of problem-based learning on student learning outcomes. The creation of the solution is the final step within the process. The goal at the completion of the problem-based learning task is students have acquired skills essential to the curriculum goals, but also have developed skills essential to becoming a 21st-century learner, including compromise, negotiation, communication, consensus, and incorporating others' ideas; all skills which are valuable in the workforce. Looking at the overall PBL structure, Thomas' criteria play a key role in the creation of the problem statement. However, when combining and synthesizing the ideas, Thomas' concept of centrality also becomes important, highlighting that problem-based learning tasks are the central part of the curriculum and the main teaching strategy. A PBL is not a project assigned after traditional instruction, essentially traditional methods of lecture and note-taking no longer exist, and the PBL replaces that element of the traditional classroom (Brush, 2017; Kumar & Kogurt, 2006; Mergendoller, n.d.; Thomas, 2000; Torp & Sage, 2002).

Teacher Perceptions of and Role in Problem-Based Learning

Teachers behaving as facilitators is a key factor in problem-based learning. In order to successfully facilitate and drive learning in a problem-based learning classroom, teachers need to know how to scaffold instruction successfully. In a PBL task, scaffolding may play out differently than a traditional classroom because it is cross-curricular. Scaffolding for different

subjects may have different approaches. Scaffolding is divided into two main types hard scaffolding and soft scaffolding. A hard scaffold is a support that is expected and can be planned on in advance, such as a graphic organizer. A soft scaffold provides assistance during the time of the project that is unplanned (Brush, 2017, p. 111). To properly facilitate, teachers must have an understanding of how to scaffold to address all types of learners in their class.

There are multiple layers to incorporating a PBL effectively. PBL projects span over many disciplines, requiring multi-subject scaffolding. This means that for it to be effective, teachers need training on more than just the factors of PBL, but also educational elements that will ensure the students utilize the opportunity appropriately. Teachers need to have some knowledge in other subjects as well as their core subjects to properly guide and assist their students. Teachers also need experience in scaffolding instruction in the classroom. Teachers should be able to differentiate according to their class and the specific makeup of students. This requires more than just training on problem-based learning instruction but also training on general differentiation and modification tactics in the classrooms (Thomas, 2000).

The teacher's role in the problem-based learning process is key because teachers dictate the PBL's success. Teachers learn to strike a balance between assisting students with guiding information and giving them leading information. A PBL problem can be difficult. Students will get stuck and need assistance. This is where the teacher's role becomes vital to the success of the PBL. If students feel that when they ask for help, they are met with a vague, unhelpful reply, it will not support the PBL positive outcomes of student motivation and self-driven learning. Part of having a teacher involved in the PBL process is to ensure that they provide the probing questions needed for students to move to the next level of the project and begin their own self-inquiry (Kumar & Kogurt, 2006, p. 114). To properly support student learning teachers', need a

strong skill set of scaffolding skills. Not all teachers find differentiation easy, and it can be difficult to incorporate and manage the scaffolding process for a class of students (Dolmans et al., 2005, p. 734; Thomas, 2000). This process can be particularly challenging even for veteran teachers. According to Ola I. Lunyk-Child's *Self-Directed Learning: Faculty and Student Perceptions*, teachers involved in the PBL process consistently questioned if their skills measured up or if they are "doing it right". Teachers were hesitant to share their methods of utilizing the PBL in the classroom out of insecurity in their facilitating skills. Teachers also expressed concern about comparing their methods to other teachers' implementation methods. If the methods were not similar is raised concerns to the teachers. Given the nature of a PBL task, it is difficult to make these comparisons because all classes are different, and the actions of the teacher should model the best practices of a PBL for their particular class. This can actually make it even more difficult for teachers to implement PBL learning because watching one teacher's methods may not work for their class (Lunyk-Child, 2001).

The teacher becomes a facilitator, a person the students can use to help solve the problem by providing guidance. Since the problem itself may not have a real solution if it is a current problem, teachers become almost like a partner to the students in the process to solve the problem (Torp & Sage, 2002, p. 16). The difficulty in teaching and training teachers with proper problem-based learning instruction is that most teachers themselves were never taught in that fashion, thus making it even more difficult to break the traditional learning style (Brush, 2017, p. 18). Teachers may need to make their own problem-based learning inquiries to gain knowledge on the topic in order to provide guidance and help facilitate the students' learning appropriately. The teachers' role is not to deliver information but to further probe, question, and challenge the students to discover their own solutions to the problems (Torp & Sage, 2002). There are many

components that teachers have to master to be able to be a “good” facilitator. In the study, discovering teachers’ opinions on how much their role impacts student performance is important.

According to Brush in the novel *Successfully Implementing Problem-Based Learning in the Classroom*. As the need for PBL in the curriculum increases, teacher training is not meeting the standards for effective implementation. Training should include strategies for future, novice, and veteran teachers on the proper implementation as well as include the differences in types of “PBL’s” for clarification. Since this is a new area of education, teachers need to be fully trained in problem-based learning concepts and outcomes. Teachers must be on board to fully implement the PBL into the classroom for it to be successful. In order for this to happen, teachers must first see the value in problem-based learning. Once teachers feel confident and excited about the PBL process, their passion can be passed onto the students. In addition, if not provided by curricula, teachers must be trained on how to make a true problem-based learning task according to Thomas’ Criteria. According to *Successfully Implementing Problem-based Learning in the classroom: Research in K-12 and Teacher Education*, “few current and future teachers have clear conceptualization regarding effective design, development, and implementation of PBL instruction” (Brush & Save, 2017). In the study, gaining an understanding of how much or how little training teachers have completed could impact the implementation of the PBL in the classroom. The study will also seek to find what training teachers feel they need; therefore, the study will help us gain knowledge to make suggestions to improve future practice.

Teachers play a key role in the PBL process. Teachers become core motivators when students lose focus or interest, the teacher that enables them to get back on track by providing guidance and a supportive environment. It is important for teachers to support students on this journey and ensure students feel confident enough to pose questions and make inquiries. To

encourage students not to feel bad when they get it wrong, but instead use these ideas to keep delving further into the question (Torp & Sage, 2002, p. 16). The teacher sets the tone for the problem-based learning process in the classroom. A teacher becomes a metaphorical coach for student learning, providing support, assistance, and advice on different ways to complete tasks. Yet they do not directly “play in the fie.” There are moments when a coach steps in to support players, but also moments when a coach knows to let the players play. This image parallels the image expected from the role of the teachers in the classroom. At times, guidance is necessary, but other times it is effective to allow students the freedom to explore the problem on their own terms (Torp & Sage, 2002; Wilder, 2015, p. 415). Based on the literature, we know teachers need more than just basic facilitation skills to properly implement a PBL but also skills in scaffolding, differentiation, and a wide range of cross-curricular knowledge.

Conclusion

Problem-based learning is gaining popularity as a valuable approach in school systems because research suggests there are positive student outcomes associated with its’ implementation. PBLs contribute not only academic outcomes but also influence student behavior. Academic outcomes can include increased critical thinking, self-directed learning, and flexible knowledge (Brush, 2017; Loyens, 2008; Saputra, 2019). In addition to these academic components, PBLs could also contribute to social skills, including effective collaboration and increased student motivation (Thomas, 2000; Wilder, 2015). These student outcomes are related to the quality of PBL design and implementation, which requires a pedagogical shift from a traditional classroom to a PBL-centered classroom; changing the classroom approach to be more PBL centered may encounter some barriers in terms of implementation.

The reviewed literature has provided us with valuable information about PBL design and teacher perceptions that increase the likelihood that problem-based learning will be implemented in a way to achieve anticipated student outcomes. Thus, teachers' understanding of not only the PBL structure and criteria and how they view their role in actually utilizing this knowledge for implementation purposes will have a great effect on the success of the problem-based learning task. Thus, this study will continue to add to this research by exploring teachers' perceptions and gaining an understanding of their PBL knowledge, and, more specifically, how they view PBL design and their role in implementing PBL tasks. Deeper understandings of teachers' beliefs will help us better understand how they implement PBL, which will allow us to better identify barriers to effective PBL implementation.

After establishing the teachers' knowledge of PBL criteria, the study will then analyze the implementation process focusing on the action theory framework, establishing what teachers believe they know and establishing how this knowledge appears in the implementation—gaining an understanding of teachers' perceptions of PBL design and their role in implementation. The implementation process will analyze PBL observations and lesson plans to determine if the perceptions are observed through the implementation process or if the knowledge the teachers indicated they know is being translated to their actions. The study will contribute suggestions on what gaps need to be addressed in order for problem-based implementation to be fully successful. The study will contribute valuable information because there is enough research to conclude that problem-based learning may be a successful strategy to implement into classrooms to produce valuable academic and social study outcomes. Gaining a deeper understanding of teachers' perceptions and their role in the process can help achieve greater student outcomes by

helping teachers best develop the governing values and espoused beliefs needed for effective and quality PBL implementation.

CHAPTER 3

METHODS

It is important to gain a better understanding of teachers' perceptions of Problem Based Learning (PBL) design and practice so schools can support teachers in developing and implementing PBL that provides opportunities for 21st-century learning. If students do not develop skills of critical thinking, creativity, communication, and collaboration, they will be at a disadvantage in the 21st-century workplace as society and technology continue to advance, requiring job positions that require these important skills.

Although policies at a national and state level have been put in place to support problem-based learning tasks, there has yet to be a full shift from traditional approaches to PBL centered classrooms. Traditional classrooms may not be providing enough opportunities for students to develop these important skills, and problem-based learning tasks emphasize the development of these 21st-century learning skills, thus making it even more important to begin to support the transition of classrooms from traditional approaches into problem-based learning foci. Since teachers play a paramount role in the implementation process, it is vital to understand their perceptions in the design and implementation of a PBL task because their understandings will influence practice. If teachers' perceptions are misaligned to best practice research, it will influence the implementation process and, therefore, impede the potential positive outcomes associated with problem-based learning tasks. In order for successful implementation to happen, teachers need a solid understanding of their role in the process. The study will contribute insight into this understanding, illuminating how perceptions align or misalign with theory and PBL best practice. By using these understandings, districts can then make informed choices on teacher professional development and training to support PBL learning. Once schools begin to recognize

the importance of teachers' roles in the process of a PBL, schools can add or edit their PBL policy to ensure successful implementation and, in turn, students will begin to develop some of the valuable 21st-century learning skills that will be so important for their success in their future careers.

This chapter will present the procedures utilized in the research design and methodology. The rationale for the purposeful selection of participants and their criteria will be presented. The data sources will be described, as well as the process for data collection and analysis. The chapter will also include steps taken to ensure rigor and credibility.

Research Questions (RQs)

The purpose of this study is to explore teachers' perceptions of problem-based learning task (PBL) design and their understandings of their role in PBL implementation. By utilizing action theory frameworks, the study will explore teachers' perceptions and implementation of PBL to illuminate how they are making sense of PBL design and their role; and, in turn, translating those understandings to practice. It asks the following:

- RQ1. How do teachers describe the design of a PBL task?
- RQ2. How do teachers describe their role in the implementation of a PBL task?
- RQ3. How are these perceptions of task and role reflected in practice?

Methodology

The study will utilize a qualitative descriptive case study. As defined by Yin (2018), a descriptive case study's purpose is to describe a phenomenon in a real-world context. This directly relates to studying teachers' perceptions as a phenomenon within their classroom as the real-world context (Yin, 2018). A descriptive case study's purpose is to utilize insight presented in the descriptions of the participants and identify patterns in their responses. By identifying

patterns in the data, explanations can later be determined and analyzed. A descriptive case study is appropriate when the study seeks to identify gaps in the research. This study sought to identify gaps in teachers' perceptions and understandings of the design and role of problem-based learning tasks. By understanding their perceptions, it will demonstrate how these perceptions may affect practice. Identifying the gaps in understanding will address potential ways to improve policy, practice, and professional development to support student outcomes when incorporating a PBL task in the classroom (Creswell et al., 2007; Watson, 2018; Yin, 2018).

The descriptive case study approach is meant to study participants in a real-world context, providing in-depth descriptions from lived experience. A descriptive case study has little to no control over the behavior of the participants, directly relating to the study. Teachers are describing their own experiences in the classroom with no interference from the researcher. This approach is not meant to create an experience to test what teachers have learned but simply describe what they have learned. In this approach, data collection focuses on lived experiences. This study included data collection from a survey, lesson plans, and a reflection. These lived experiences will correlate with classroom experience focusing on teachers' perceptions of problem-based learning and how these perceptions influence practice (Yin, 2009, 2018).

Qualitative research is fitting for this study because teachers' perceptions are the focal point of the research allowing more flexibility to analyze data from the survey, lesson plan, and reflections, allowing themes to emerge within the process. The real-life aspects of qualitative research also make it appropriate for this study (Watson, 2018; Yin, 2009). Qualitative research contributes insight to explain human behavior. For this study, the teachers' perceptions were studied to explain their implementation process or behavior in the classroom, contributing insights to their choices and, therefore, also providing insights into their understanding of

problem-based learning. Since all teachers will share a category of Urban Elementary Title I schools with PBL in the curriculum, the case study will focus on this group's perceptions and how these understandings influence behavior.

Sampling Strategies and Participant Demographics

Purposeful sampling was utilized in the study to generate information-rich data on the phenomenon of teachers' perceptions (Farrugia, 2019, Palinkas et al., 2015). Participants fitting the criteria were contacted via email and sent the survey. Creswell (2007) suggested that five participants can support a qualitative study. Eleven teachers were contacted via email, and six replied. These six participants completed the data collection through Google Forms. Although both genders were contacted, the six participants who responded were all women. Four districts are represented by the six participants. Five schools are represented in the data collection. Data collection was conducted at the end of the school year, which provided the time that teachers needed to implement the problem-based task and also allowed them to choose which task they wanted to use for data collection. The criteria for participants were purposely selected to yield the greatest results for data collection.

All participants fit the criteria of a NJ Title I urban school that includes PBL in the curriculum. Although the districts may not mandate PBL, it is expected to be used within the schools as a professional strategy. Research supports that PBL may yield high results in at-risk districts (Belland et al., 2006; Brush; 2017; Torp & Sage, 2002). The teachers are in 6th-8th grade and teach either language arts or social studies. The grade and subject levels are also an understudied area of problem-based learning research; therefore, the study can contribute information to this area (Belland et al., 2006; Brush; 2017; Torp & Sage, 2002). The study also focused on participants that teach language arts or social studies since these subjects tend not to

be a central focus of problem-based instruction. Many PBLs incorporated into the school curriculum tend to focus on math and science. However, the nature of a PBL is cross-curricular; therefore, the perceptions that teachers within language arts and social studies classrooms provided added insight into problem-based learning implementation (Brush, 2017). Four of the participants were language arts teachers. Two participants were social studies teachers. However, two of the four language arts teachers also indicated that within their curriculum, they work directly with the social studies teacher during the problem-based task. These two participants were from the same district. Lastly, the participants ranged in grade level and experience. Two teachers taught 6th grade, one teacher taught 7th grade, and three teachers taught 8th grade. The sample pool also displayed a wide range of experience from the teachers. Three teachers had under 10 years of teaching experience, two had over twenty years of experience, and one ranged between 10-20 years of experience in the classroom.

Methods: Data Analysis & Data Collection

The data collection for the study consisted of three parts: a survey, lesson plan upload, and reflection. First, a survey was administered to participants. The survey had 16 questions total and contained a mix of both open and closed survey questions. The open-ended questions provided details into teacher perceptions of task design and role. Qualitative research indicates the use of both open and closed questions can provide valuable information providing direct answers with opportunities for explanation (Baxter & Jack, 2008; Fowler, 1995; Salant & Dillman, 1994). However, the closed survey portion did not provide additional information that yielded results that answered the study's research questions. The open-ended survey questions provided the data used to address the research question. Although both approaches were intended to help address the research questions, only the open-ended responses were used. Second, lesson

plans were collected. The lesson plan provided by the participants was either an official lesson plan or a copy of the problem-based learning task they used. Qualitative research supports the collection of documents within a case study (Baxter & Jack, 2008; Yin, 2009). The lesson plan document provided an understanding of how teachers took curricular mandates and their understandings and planned them into practice, providing an opportunity to see if the descriptions provided by the teachers translated into their practice. As qualitative research proposes that what people say may be very different than what they do, the lesson plan provided valuable insight into teachers' PBL implementation (Hoddler, 1994). Third, reflections were collected from participants. The reflection provided an opportunity for teachers to further demonstrate their understanding by allowing them to explain how or if the lesson went according to plan. The reflection is another qualitative document that utilized open-ended questions to elicit detailed responses. The reflection provided teachers an opportunity to explain how they would edit or change the PBL task they included to be more aligned to their understanding, and thus, provided the researcher more details on their understandings of PBL tasks (Fowler, 1995; Hoddler, 1994; Yin, 2011).

After data collection, the study utilized Yin's (2011) method of data analysis, including compiling, disassembling, reassembling, interpreting, and concluding, which will be further described in this chapter. Each participant's data was analyzed and coded together, creating themes within just that participant's data collection. Then, the participants' themes were compared to the other participants to create overall themes. Sections of the data collection were coded to pertain to specific research questions. RQ1 and RQ2 both sought to understand teachers' perceptions of task design and role. RQ1 focused on their understanding of PBL design, highlighting elements of collaboration, real-world questions, and ill-structured design.

RQ2 focused on how teachers used these perceived elements of design and implemented them into practice, highlighting elements of teacher facilitation and student-driven classrooms. RQ1 and RQ2 will be answered based on the survey. RQ3 focused on how these perceptions of task and role were reflected in practice and looked for elements such as communication, collaboration, creativity, and critical thinking opportunities within participants' practice. RQ3 will be answered by utilizing the lesson plan and reflection. From there, the chapter will outline common themes that emerged from the data sources to connect with all participants. Data sources were analyzed using Saldaña's (2015) method of First and Second Coding strategies. The First Coding session strategy will incorporate Yin's (2011) process of compiling and disassembling. Compiling consisted of the gathering of all three data sources. The disassembling process found elemental coding, including descriptive and in vivo codes that were used to identify patterns and themes within each participant's data sources (Cope, 2010; Saldaña, 2015). In vivo coding was also be used during the First Coding session to use direct statements from the participants and highlight common words or phrases within them that added to the identified patterns or themes (Cope, 2010). Inductive coding was also used to allow the additional code of "cross-curricular" to emerge from the data (Chandra & Shang, 2018). The Second Coding session will connect to Yin's (2011) process of reassembly, which found common themes and patterns between all participants (Saldaña, 2015, Yin, 2011). Lastly, Yin's (2011) process of interpreting explored possible reasons for these patterns to occur. The conclusion process explored possible suggestions for future policy, practice, and research. The interpreting and concluding process will be further discussed in Chapter 5. See Table 1 for a summary of the research plan.

Table 1

Research Plan

Research Question	Data Sources	Data Analysis Strategies	Ensuring Rigor
RQ1: teachers' descriptions of PBL design	-Survey	- <i>Priori Codes:</i> collaborative, real-world, ill-structured - descriptive/emergent code: cross-curricular	- survey pilot test - triangulation
RQ2: teachers' description of their role in PBL implementation	-Survey	- <i>Priori Codes:</i> facilitation, student driven - descriptive/emergent code: cross curricular	- survey pilot test -triangulation
RQ3: teachers' perceptions of task and role reflection in practice	-Lesson plan -Reflections	- RQ1 & RQ2 codes - <i>Priori Codes:</i> creativity, critical thinking, communication, collaboration - descriptive/emergent code: cross curricular	-member checks -triangulation

Ensuring Rigor

In order to ensure credibility and trustworthiness in qualitative research, it is important to have multiple data sources. This allows multiple ways to understand the phenomenon and ensures reliability and credibility in the sources. Credibility ensures the truth of the findings and correct interpretations of the participants' viewpoints (Korstjens & Moser, 2018). The study utilized the triangulation of data to strengthen the validity of the research utilizing the three data sources of a survey, lesson plan collection, and reflection. Having multiple sources of data from

the participants ensures the credibility of the data (Baxter & Jack, 2008; Hoddler, 1994; Korstjens & Moser, 2018; Patton, 1990; Yin, 2003).

In addition, to maintain trustworthiness, member checks were also utilized. Given the small sample size of the study, findings can be verified by the participants for any clarification ensuring trustworthiness and credibility. Clarification can be utilized by the participants to ensure their data sources reflect their intended meanings. This can be utilized to clarify any wording in their lesson plans or to clarify any descriptions in their reflections (Kornbluh, 2015).

In order to ensure trustworthiness in the study, a pilot test of the survey was put in place. A participant who was not involved in the study voluntarily took the survey and provided feedback on the questions. This participant will fit the same general characteristics of the study and will be from the same district, but may be involved with a different subject and therefore is not selected for the study criteria. However, given the cross-curricular nature of PBLs, this teacher will still be able to provide feedback on the study's survey question structure. This feedback will be done in person, and the participant can talk through their thoughts on the questions. The purpose of including a pilot test is to ensure the phrasing of the questions is clear. During the pilot test, the participant will also discuss what answers they associated with each question based on it is phrased. This ensures the wording is gearing towards the specific answers needed for the study and is not redundant. In addition, including a pilot test will also help determine an appropriate length for the survey. After the pilot test, the survey will be revised as needed (De Vaus, 2013).

Ethical Considerations

IRB is needed for this study to collect surveys, lesson plans, and reflections. My researcher bias includes my personal opinions on the implementation of PBL's in my 8th grade

Language Arts classroom in an urban school. I also teach in New Jersey. Understanding this bias will enable me to be aware of the structure and wording of my interview and survey questions to ensure I remove any wording that would hint at my personal opinions.

As part of ensuring that the data collected from the study were as objective as possible, reflexivity was practiced in the study. Reflexivity is the practice of examining preconceived values and considering how these considerations will impact the study, developing an awareness of the researcher's role in the process (Korstjens & Moser, 2018). Since I am a part of the district that I will be focusing my study on, it is important for me to reflect and ensure that my bias about the district is removed from the study. Although it is not possible to remove all assumptions, I will put aside assumptions and conduct the study as objectively as possible (Ahern, 1999).

Statement of Positionality

As a teacher in an urban Title I school, I do believe that PBL can be a valuable aspect of the curriculum. My current district includes PBL, so my own thoughts for problem-based learning instruction is centered around my experiences as a teacher. I fit the sample pool, which has sparked my interest in further understanding participants in this sample. I expect to share many of the experiences disclosed by my participants because the participants and I have been teaching under similar circumstances. Within the study, I discovered the area of disconnection in PBL knowledge. I hope to share what some of those misunderstandings are, and in turn, help schools and districts improve their choices for PBL implementation.

I do believe that PBL is an underused resource for implementation in high risks districts and that although it is included in the curriculum, it is not emphasized and, therefore, may not be a priority for teachers. I also do believe many districts include PBL but do not display a full understanding of how to implement it effectively. I am expecting teachers to contribute answers

that may explain this notion. As a teacher myself, I can recognize my own gaps in knowledge; even though I have used PBL within my classroom on multiple occasions, I still realized, until recently, that I was not trained in all of PBL's components.

CHAPTER 4

RESULTS

As schools continue to develop to prepare students to enter the ever-changing workforce, the push for 21st-century skills has taken a prominent role in the school curriculum, highlighting important skills such as critical thinking, collaboration, creativity, and communication (Brush, 2017; Loyens, 2008; Nargundkar, 2014; NEA, 2020). Although traditional classroom approaches have elements of these skills, it is unclear whether or not traditional approaches are providing enough support for students to truly explore and develop these important skills (Hmelo-Silver, 2012; McKensie, 2012; Torp & Sage, 2002). As technology progresses, students may be presented with new challenges and careers, thus making it vital to focus on skills that are transferable to many different careers to properly prepare students for success. Problem-based learning can be an effective tool used by schools to help facilitate and develop these important skills (Brush, 2017).

Although educational policies have emerged at both national and state levels supporting the inclusion of problem-based learning in the curriculum, such as the New Jersey Student Learning Standards: Standard 9 (titled “21st Century Life and Careers”), New Jersey Student Learning Standards Technology Literacy Framework, and the New Jersey Cross-Content Workplace Readiness Curriculum Framework; it is still unclear how these policies have translated to district curriculum and even more specifically, into the classroom. Shifting from a traditional approach to a problem-based learning approach can be difficult since it requires teachers to learn a completely new set of skills (Brush, 2017; Brush & Save, 2017; Thomas, 2000).

The purpose of the study was to explore teachers' perceptions of task design and their understandings of their role in relation to PBL implementation and utilized Action Theory Framework developed by Chris Argyris and Donald Shon (1976). The framework focused on understanding teachers' perceptions through espoused theory and theory in action. Since teachers play such a paramount part in the implementation process, the study gained a deeper understanding of teachers' perceptions in the process. It specifically asked:

RQ1. How do teachers describe the design of a PBL task?

RQ2. How do teachers describe their role in the implementation of a PBL task?

RQ3. How are these perceptions of task and role reflected in practice?

A strong sense of teachers' perceptions of PBL design and implementation may contribute more insight into areas that may require more training, knowledge, or clarification. The identification of these specific areas may help to maximize the benefits of problem-based learning tasks and influence policy and practice to support PBL instruction.

The research utilized a qualitative descriptive case study approach and focused on teacher perceptions as a phenomenon within the real-world context of their classroom (Watson, 2018; Yin, 2018). A descriptive case study is used to identify insights in the participants' responses of a lived experience, in this case, their experience of an implemented problem-based learning task. The study used these insights to identify patterns between participants. The descriptive case study illuminated teachers' understandings in research and specifically highlighted teachers' understandings of task design and role (Yin, 2018). Understanding these perceptions demonstrated how teachers perceived the design of a PBL task and how their role influenced their practice and therefore, addressed potential ways to improve policy, practice, and

professional development to support student outcomes when incorporating a PBL task in the classroom (Creswell et al., 2007; Watson, 2018; Yin, 2018).

Themes

There are four major themes that emerged from the data collected from the teacher participants. The first theme includes the idea that teachers view their roles as facilitators, but facilitation has a learning curve because it lacks clear guidelines. The second theme focuses on student collaboration. Teachers' practice includes student collaboration, but teachers struggle to combat students' collaborative conflicts. Collaboration itself may require its' own primers. Theme three shows teacher practice includes problem-based instruction, but there is a dilemma when to use project or problem-based learning. Lastly, teachers would love to use problem-based learning but are concerned with time constraints for student research. These four themes could share insight into how teachers' perceptions of task design and role are reflected in practice and provide further insight if or how the initial descriptions are present within the implementation of the PBL.

Theme 1: Facilitation has a Learning Curve

The first theme states teachers view their role as a facilitator, but facilitation has a learning curve because it lacks clear guidelines for how to let go and encourage a student-driven classroom. Teachers may view their role as a facilitator, but effective facilitation takes practice. Facilitation seems to lack clear guidelines as to how to take ideas of facilitation and apply them to the classroom. Central to this theme is the idea of a student-driven classroom. When students drive the task, teachers naturally take the role of the facilitator. Four of six participants mention the role of students is to drive instruction. Teachers' descriptions of the facilitator role were accurate but demonstrated a struggle to take that understanding and apply it within their

classrooms. Three of the six participants state their struggle with facilitation. The participants were able to clearly define the role, with phrases such as “A facilitator is there for guidance, not answers,” “teachers are a facilitator and students are in charge of their own learning,” and “a teacher’s role is to guide students through the process and assist with confusion.” Other participants clearly stated, “I am the facilitator of the class,” and “A teacher’s role is to facilitate and to ensure that the students are on task and meeting specific goals set for the PBL.” Although definition wise, teachers were confident in their answers, evidenced by five of the six participants clearly defining the facilitation role, the actual application of these descriptions was not present in their lesson plans. It is reasonable to conclude that the more a teacher struggled to facilitate effectively and saw no positive outcomes, the more structured the task became; this placed more control in the teachers’ hands by providing clearer directions and requirements, thus, reverting to traditional prescriptive measures of instruction instead of supporting PBL and the struggle to “let go” of their traditional roles.

Although teachers are aware their role is to facilitate, what facilitation means still remains general and thus difficult to apply to a real classroom experience. One participant specifically discusses the role of facilitation and states:

I think the teacher is more an observer in terms of the learning itself. However, they would also not be passive and should constantly be circulating, and getting a pulse on the engagement and motivation is important. Now he/she provides resources students need and the general process/skills, I think that the teacher is mainly positive support.

Although the response seems to give specifics, it still does not provide details of how to engage, motivate, or support. It seems a key aspect of effective implementation stems past just identifying the role of a facilitator in the classroom, but instead providing clear examples and

guidelines as to what that role may include. Participants generally described the specifics of facilitation with three main categories, including questioning tactics, resource guidance, and pacing management.

Questioning

All participants associated effective implementation with questioning strategies stating, “The teacher is circling around asking questions, but not ‘teaching’ the content.” Other participants also state the use of utilizing questions during the facilitation process: “I ask critical thinking questions when students get stuck,” “I would ask guiding, open-ended, thought-provoking, and higher-order questions,” and “I made sure students were on task and asked questions.” Although all participants mentioned the idea of questioning as an important element of facilitation, few described the details of questioning and what higher-order” questions would look like. Some touch upon the idea with statements such as “a probing question” or “respond to a question with a question,” but most keep the ideas general, which may make it difficult to facilitate within the classroom. One teacher goes into detail with the questions used in the classroom and states:

I always keep questioning the students and play devil’s advocate. I ask them questions like, ‘Would this work if this happened?’ or ‘Is that really the best option?’ This way, the students can verbally explain their rationale, and I now have gauged if they understood the topic or not through verbal assessments.

Although this participant provided specific questions she may use in the problem-based learning task, there is no evidence of these questions driving higher-order thinking. Participants described that questioning should drive this higher-order thinking, but few seem to have a clear understanding of what higher-order questions may look like in a teacher-facilitated classroom.

Resources

The next general idea teachers associate with facilitation is guidance on resources. “Resources” as a topic divides into several aspects of how teachers approach utilizing and planning sources within the classroom. These include providing sources, helping to analyze sources, and preparation for finding sources. Teachers described a variety of ways to help students pick appropriate sources for their grade level and project stating they help “guide students to appropriate resources” and “gather appropriate resources for students.” Generally, it seems, three of the six participants associate their role with finding and providing these resources by stating, “I would provide more resources for students to explore, help them with their researching skills” and “Giving students adequate background information.” One participant further adds to this element by stating they “offer useful websites and provide source documents in class.”

The second notion associated with research and facilitation is the act of helping students navigate through the difficult material. One participant stated their role was “helping annotate difficult material.” In addition, another participant also stated she will “Offer possible annotations to some of the more difficult material.” Teachers also discussed the student use of these provided materials and highlighted their purpose within the PBL task stating they would use these documents to “research thoroughly.” One participant specifically describes helping students with sources and states:

I assist students in different ways. It often depends on their level. Some students need help with identifying credible sources for their PBL data gathering, while other benefits from probing questions.

Lastly, two participants discussed their personal preparation for the problem-based task by utilizing the resources before allowing students to access them, stating they use these sources to learn about the topics themselves and “explore websites, source documents, and other media”

and “investigating websites to ensure they are age-appropriate for the group I am teaching.”

Overall, it is clear resources play a role in effective implementation, but there are several views of what the teachers’ role is when it comes to helping student begin their research.

Pacing Management

The last main element teachers described with facilitation was an aspect of pacing their students and keeping them on track by including rubrics, timelines, and check-ins. Some participants discuss providing the timelines themselves; others describe helping student groups make these time management and pacing plans. Two teacher participants indicated these plans are made by the teacher, stating, “Teachers provide a timeline, check-ins, offer useful websites and provide source documents in class” and “I develop a ‘rough’ timeline with the ability to add or subtract time as needed.” Others indicated they help groups make their own timelines and stated that they “help with planning potential timelines for the groups.” One participant states the purpose for this element of facilitation, stating that,

The students’ role is to have a clear understanding of the problem as outlined and develop a ‘project map’ if you will; a sort of calendar of activities so they can develop a system of doing the project over time rather than at 2 am the morning it is due.

Four participants discussed the use of a deadline, stating students must “adhere to deadlines” and that “there is a timeline outline and frequent check-ins to make sure students are completing each step.” Teachers view their role as a facilitator by pacing students during the task. Teachers stated phrases such as “check their progress,” “reiterate procedures and timelines,” and “make sure they are on task.” Although PBL by nature is more ill-structured, many teachers state an element of developing rubrics and ways to monitor student work (Brush, 2017; Thomas, 2000). One participant states the facilitation role includes “developing parameters for students,” while another participant added that “developing rubrics” assists facilitation. Lastly, one participant stated, “A teacher’s role is to facilitate and ensure that the students are on task and meeting

specific goals set for the PB.” Thus, teachers have varying views on how much guidance to provide students when setting the pace in the classroom. Teachers also think providing materials for organization is an important part of helping students pace their work.

Challenges of Letting Go of a Teacher-Centered Classroom

Although teachers were able to clearly identify the student-led aspects of problem-based instruction, making statements such as, “Students get to decide which direction to proceed,” “Students decide the end product and how they will get there,” and “problem-based learning is inherently student-centered.” However, allowing the freedom to the students was a challenge to the teachers. The teacher participants generally concluded PBL is designed for student freedom stating they work “on their own trial and error,” “students advocate for something they believe in,” “the focus of PBL is more on skills the students practice along the way more than the final product,” and “students cannot be passive and just absorb in this learning process, they must be active participants in their learning.” Although this element was clearly identified, supporting a student-driven classroom was challenging for the teachers. One participant stated that PBL is met with complaints from the students for the amount of work, but also stated, “I have often heard students complain about the amount of work a PBL requires. However, they are prouder of the work they accomplished at the end of the project than when it is just a traditional classroom activity.” Another participant added, “Many times, students get ‘stuck’ in the process.”

Some participants clearly state their struggle with facilitation, exhibiting difficulty relinquishing control in the process, and were reflective about this notion. One participant stated,

Often the students want you to guide them to the correct answer (which there is none). I have not yet been able to totally “let go.” They want way too much support; they are not yet confident in their process and product.

As illustrated with the comment, students may not be ready to be completely independent in the process and perhaps require additional supports before even starting a problem-based task.

Another participant stated,

I found that a lot of students became stuck. They would know their stance but had a hard time defending their stance. I did my best not to ask leading questions, but sometimes it was difficult when students resisted or became frustrated.

The responses indicate that students definitely experience frustration with PBL, but teachers seem to be unclear on how to meet this frustration with their students and navigate through it effectively. These responses provide some specific feedback on where PBL implementation may need more assistance. It is clear that the teacher participants understand the design and role on a surface level. The descriptions were accurate; however, the actual implementation was difficult. It is easy to state what is supposed to happen, but it was much more difficult to actually make it happen within the classroom. Although teachers knew what the process should be, the actual process of relinquishing control seems to be more challenging than expected. Facilitation may require more practice for teachers to feel confident in the classroom.

Theme 2: Combatting Collaborative Conflict

Theme 2 states that teacher participants' practice includes student collaboration. However, fulfilling a collaborative role is challenging for students, and many do not naturally know effective collaborative methods. All participants described some form of student collaboration, but many participants expressed issues with the student collaboration side of problem-based learning implementation, and three of six described the difficulty of trying to navigate conflicts between student groups. The participants were able to clearly identify that students should be utilizing a collaborative effort, but they expressed many problems within groups that may hinder the progression of the problem-based task. Although problem-based learning has many positive outcomes, including effective student collaboration, students may

need some primer lessons or instruction on what proper and effective communication and collaboration may look like within a group. Participants expressed many forms of ineffective student collaborations, such as trouble appropriately delegating, disagreements, or avoiding working together at all. Three of the six participants included student collaboration, but it was very prescriptive, thus detracting from PBL goals. Collaboration itself is a skill, and that skill may need to be developed within the classroom before collaborative elements can be truly effective. Participants referenced student collaboration generally, stating that they “worked cooperatively” and “asked each other questions as to if their rationale made sense,” or “used discussions.” One participant added how student collaboration was used to incorporate some effective strategies into the classroom, stating,

At the beginning of the unit, we had a very heated debate about gangs and other themes present in the novel. More student interaction and discussion of this nature would be beneficial for students to go through a process together and learn both with each other and on their own.

Participants generally described effective student collaboration within the reflection when discussing activities such as small group instruction, progress checks, student-centered discussion, and peer teaching. The group interactions are described generally, as one participant states she was “allowing students to discuss what they had learned.” Another participant added, “Students ask each other questions, especially those working on the same topic. They ask each other for assistance uploading or formatting PowerPoints.” Although students are communicating within the PBL task, what students actually discuss plays a large role in whether or not collaboration is effective. Although formatting questions may be useful, it does not actually drive forward instruction. However, monitoring students to communicate effectively may present an added challenge for teachers. One participant shared what is included to try to get students to work together, stating, “I would include a lot of personal reflection and peer

discussion so that students can not only be aware of their own thinking but also see others thought processes.”

Although participants clearly defined student collaboration as part of a problem-based task, many described the challenges of integrating effective collaboration with their students stating they “assist groups struggling to work collaboratively” another participant adds she “assists groups who are struggling to work collaboratively in a positive way,” demonstrating having students discuss topics well presents its own set of challenges. Other participants added more details to the struggle of effective student collaboration, expressing that students did not interact as much as intended during the process and tried to complete many parts independently, “students did not interact much with each other regarding the issues presented to them in the prompts.”

Three participants specifically noted the age group presented problems in terms of effective student collaboration, stating that “the students interacted negatively with the collaborative work, the social interaction was hard for this age group” and “The majority of the group was able to successfully complete the project. As with many group projects, the social drama got in the way of some.” Collectively, teachers seemed to agree that student collaboration is difficult, but for a middle school age group, it may present even more challenges. One participant explained further:

As with many middle school students, drama interfered. Who wasn’t doing enough, who was too bossy, etc.? Sometimes I think the goal of a PBL is not so much what they learn about a topic but what they learn about themselves and the people around them. The ability to collaborate can be daunting to some.

Teachers are faced with combating many types of student collaborative conflict and struggled to effectively implement PBL in the classroom with students who struggled to collaborate

effectively. Given that student collaboration is a large component of the PBL process, this was an added challenge to teacher facilitation.

Theme 3: The Project vs. Problem-Based Learning Dilemma

Theme 3 states that teacher participants' practice includes problem-based instruction, but there is a dilemma on when to use which practice. Three of the six participants clearly voiced some sort of confusion with the difference between problem-based learning and project-based learning. One participant used them as synonymous terms. Others also used the terms "projects" or "with these projects" when asked to describe their problem-based task. The participants continue to switch back and forth between the terms using phrases such as "Most of, but not all of the projects done in class are PBL," "Students are in charge of their own learning with these projects," and "I created digital lessons and projects that were based in PBL for student learners." Participants who clearly defined problem-based tasks then described and included tasks with more project-based qualities, stating, "This project allows them to use all the knowledge they have gained to create what they would believe is their perfect country." This confusion will directly affect task design understanding if teachers consider them similar tasks, and at times, even synonymous tasks, when, in reality, they have some key differences. Some of the participants described problem-based learning very clearly, but the PBL itself actually clearly reflected project-based learning, thus, highlighting a misalignment with teacher understandings of the task and implementation.

Within the reflection, multiple participants identify this confusion. Other participants were also able to offer potential solutions to make the original task they included for problem-based learning more aligned with their initial description of problem-based instruction. One participant shared a plan that included a Menu Board with three options: a creative portion, a

persuasive writing portion, and a magazine creation based on the novel *The Outsiders*. Although the choice is present, each category lists out specific options. This participant recognizes the misalignment and stated:

Originally, I confused project-based learning with problem-based learning. The ‘Take a Stance’ portion of the menu project is the closest to a PBL. It asks students to write a persuasive essay on one of two things: (a) whether Ponyboy from *The Outsiders* should go to foster care and (b) whether *The Outsiders* should be taught in schools. This connects to the idea of PBL tasks because its intention is that each student has different reasoning behind their answer, which makes the question complex and multifaceted. However, to categorize it as more of a PBL, I would lay out more of a process in terms of, for example, research into how foster care works, personal testimonies from people who have gone through foster care, etc.

There is an unclear understanding of the differences between problem and project-based tasks and how they pertain to particular subjects.

It seems that little instruction has been provided to teachers on the difference between problem-based and project-based tasks. This may be specific for the subjects of language arts and social studies, where creating “problems” may not be as obvious since they are societal. However, given the core components of problem-based learning, the task itself should be cross-curricular and should be able to incorporate these subjects. Although teachers state they know about problem and project-based learning, their exposure is limited or varies. One participant stated:

“My understanding is very limited due to lack of training and exposure. The designed lesson feels more project-based than problem-based.”

Although two participants are able to identify their own confusion between the two tasks, based on the included lesson plans, there are many participants who may be having similar misunderstandings about the difference between project- and problem-based instruction. Other participants described their exposure to problem-based learning from other sources. Two stated

that their knowledge was from a college class, and one participant stated, “I used problem or project-based learning in a NY Catholic school 20 years ago.” This shows that knowledge participants have on problem and project-based tasks are from a variety of different sources and thus, could contribute to the confusion between the two tasks. Multiple participants clearly described problem-based instruction, but when asked to include their problem-based task, the task included was not fitting for the description they just gave. This insinuates that some teachers may not even realize the misalignment between the terms. Teachers may be thinking they are implementing a problem-based task based on their current understandings; if that current understanding is a blurred line between problem and project-based tasks, this will directly affect implementation effectiveness.

Theme 4: Time Concerns

Theme 4 states that teacher participants would love to use problem-based learning but are concerned students won’t have enough time. Three of the six participants clearly indicated to properly implement a problem-based learning task; students needed more time, stating, “I would love to be able to devote more time to the PBL.” This was apparent within the reflections when teachers were asked what they would change. The common theme was students needed more time to deeply investigate the topic. Without that added time, the task did not delve into those deep levels of student understanding. One participant noted, “I wish there was more time for students to springboard and create their own thesis questions and explore further.” This is important to note because it ties back to how the curriculum itself is implemented. According to problem-based research, a PBL task should be the curriculum, not something added to the curriculum (Brush, 2017). What participants are describing seems to be an add-on to the

curriculum, and therefore, it will be very difficult to have enough time to implement and focus on properly for best results.

Other participants described different aspects they would add to their PBL task if students had more time within the classroom, stating that students could “move at their own pace” or “construct their own analysis.” A core component of the research-based element of PBL instruction is students need time to deeper investigate their proposed problems. The participants collectively felt to get to this deep level of research, students needed more time: “Many students needed more research time and couldn’t do it at home because they didn’t have WIFI.” Another participant described the PBL task as although it took a lot more time to research, the students had increased motivation and interest in their task stating, “Students are often prouder of what they have accomplished at the end than with a traditional classroom activity.”

The concern with time highlights an issue within the school’s curricular mandates, showing that this is not an essential part of the curriculum. Only a portion of class time is intended for the PBL when, essentially, PBL should be the entirety of the lesson each day. This factor may impact the effectiveness of PBL instruction because the element of allowing students to delve deep into the topics contributes greatly to the later benefits of the problem-based learning task. Without the time to fully explore, the students are missing out on these valuable skills (Brush, 2017; Kumar & Kogurt, 2006; Mergendoller, n.d.; Thomas, 2000; Torp & Sage, 2002).

Conclusion

In conclusion, four key themes emerged through data analyses that contribute to helping understand teachers’ perceptions of task design and role when implementing a problem-based learning task. Facilitation is challenging and may require some practice and a learning curve

before being truly effective in a PBL classroom. Facilitation strategies are vague and lack clear guidelines making it even more difficult for teachers to let go of traditional learning styles and fully support a student-centered classroom. Although it is clear that collaboration is essential to teacher practice, effective collaboration presents a new set of challenges for teachers. Teachers are faced with combating group conflict to help students effectively communicate. Collaboration may require specific lessons on what effective communication with others may look like for students. Students may not naturally know how to effectively interact with each other. The third theme presents the dilemma between project and problem-based learning tasks, both valuable teaching methods, but with different goals and purposes. Teachers seem to blur the differences between the two and utilize them as similar tasks in their instruction. Lastly, teachers would love to use problem-based learning but are concerned there is not enough time to properly implement the task and allow students to fully research and explore their ideas. These four themes contribute valuable insight into teachers' perceptions of task design and implementation.

Chapter 5 will present these findings in connection to the theoretical framework, highlight potential reasons for the development of these four themes, and compare findings to the theoretical framework and existing literature presented in Chapter 2. Chapter 5 will also present how the findings converge, diverge, and expand prior scholarship and how these findings may inform future policy, practice, and research.

CHAPTER 5

CONCLUSIONS

The purpose of the study is to explore teachers' perceptions of problem-based learning task design and their understandings of their role in relation to problem-based learning implementation. The study utilizes a descriptive qualitative case study that focuses on teachers' perceptions as the phenomenon and the real-life experience within the teachers' classrooms. Deeper understandings of teachers' perceptions are important because, theoretically, teachers' perceptions of task design will affect how the problem-based learning task is implemented into the classroom and, therefore, influence student outcomes. The study collected three data sources, including a survey, lesson plan, and reflection. The survey consisted of open and closed questions and provided general information and understandings of what teachers perceive a problem-based learning task to contain. The survey contributes to the understanding of RQ1, providing a description of the task design from a teacher's perspective. The survey also provides information addressing RQ2, describing teachers' understandings of their roles and the students' role within problem-based learning instruction. The lesson plan collection is essential to demonstrating how teachers take these understandings of task and role and plan them into practice contributing to answering RQ3. Lastly, the reflection provides an opportunity for teachers to indicate if the lesson they implemented went according to plan and if the plan was aligned to their perceptions of a problem-based learning task, also contributing to answering RQ3. Both the lesson plan and reflection will demonstrate how teachers describe how their perceptions of task and role are reflected in practice.

The analysis of the study was conducted through Yin's process, including compiling, disassembling, reassembling, interpreting, and concluding (Yin, 2011). The analysis began with

collecting the data from six participants on a Google forms document. Once collected, each of the participant's responses was printed and manually coded with the corresponding codes and the emergent coding referenced in Chapters 3 & 4. The participant's data were kept together for this part of the analysis. The themes were determined based on what participants repeated multiple times within the data collection. This process was repeated with each participant. From there, the data were reassembled, and common themes between participants emerged, creating four major themes within the data related to facilitation, problem vs. project learning, collaboration, and time. These themes all played a major role in the participants' responses.

Chapter 5 will focus on the interpreting and concluding portion of Yin's analysis to address the research questions. Findings will be compared to the existing scholarship to illuminate how findings confirm, diverge, and expand existing scholarship. The chapter will highlight implications for policy, practice, and research for successful problem-based learning information.

Summary of Findings

Chapter 4 presented the results of the study, and this chapter will connect the study to a wider purpose, making connections with research questions, literature, and theory. In this section, a summary of findings in relation to each research question is presented.

First, findings illuminated how teacher participants experience PBL as an extended collaborative classroom experience, providing students freedom in their learning choices. Students' freedom includes additional choices in their groups, topics, and presentations. Within this collaborative experience, students discuss topics with each other and conduct in depth research into the topics they choose. Teachers experience this collaborative experience by providing guidance to the students' research, engaging in thoughtful discussion by utilizing

guiding and thought-provoking questioning strategies. Teacher participants guide this collaborative effort by providing valuable research material and gearing students towards credible sources. Teacher participants experience PBL as a deep dive into these topics, helping students make real connections to their work, facing challenging elements of facilitation to produce the intended positive outcomes associated with the PBL experience.

These understandings of how teachers perceive, describe, and experience PBL were used to answer the research questions. The first research question asked: How do teachers describe the design of a PBL task? The research question sought out specific elements within the descriptions that demonstrated teacher understanding, including collaboration, real-world elements, and ill-structure. Most of the participants were able to adequately describe the design of a problem-based learning task, specifically with every teacher participant referencing the importance of collaboration within a PBL task. The participants made direct statements between the data sources, describing different forms of student collaboration, including small groups, class discussion, peer teaching, and peer questioning. This demonstrated an overall understanding of the importance of a collaborative element in the PBL task design. In addition, four of the six participants also strongly included a reference to an ill-structured problem statement within their descriptions, specifically noting a real-world connection to the problem statement. The details of the real-world problem statement varied as some participants shared that the real world was relatable to the students, and therefore, more community based, whereas other participants demonstrated understanding of a widespread worldly problem. Although the concept of ill-structured within PBL design is noted between most of the participants, there is a discrepancy between what constitutes ill-structure among the participants. Some teachers described ill-structure as allowing students more choice between topics, groups, or types of

projects (Brush, 2017; Thomas, 2000). Two participants reference ill-structure in terms of their problem statement, specifically noting to keep the statement general to allow students the freedom to explore various elements of the topic they personally find interesting. Lastly, many of the participants described the PBL task as cross-curricular in nature, demonstrating how PBL design differs from a traditional approach and uses all subjects.

The second research question asked: How do teachers describe their role in the implementation of a PBL task? The key difference between PBL and traditional methods is a student-driven and teacher-facilitated classroom. Within the participant responses, these were the foci that demonstrated their understanding of their roles in the classroom. Most participants were clearly able to describe their defined roles within a problem-based learning task and stated the task is mainly student-driven, and they acted as facilitators. Teachers had varying descriptions of what facilitators would do, including asking questions, monitoring timing, and assistance with finding credible research. Teacher participants also included specific activities they would use to help the students along, including small group discussions, debates, and encouraging peer to peer interaction and tutoring. When the participants described student-driven models, they included descriptions of topic choice, freedom for research, and multiple modes of presentations of material. Participants also described the aspects of student-driven instruction stating students should be exploring concepts themselves, ones they find interesting to make more choices and stay focused and motivated.

The last research question asked: How are these perceptions of task and role reflected in practice? Problem-based learning tasks seek to provide students opportunities to develop important transferable 21st-century skills, including creativity, critical thinking, communication, and collaboration. These key outcomes were used as codes to address RQ3 because to generate

these outcomes, task design and roles need to be aligned. Although all of the participants note these outcomes in some fashion within their three data sources, most of the participants provide prescriptive activities instead of students driven tasks. The teacher participants stated their activities provided opportunities for students to be creative and utilized critical thinking, but the students were provided specific options for the task and given specific questions to answer, thus limiting these outcomes since they were not derived from the students. Since many of the teachers presented lesson plans that were more prescriptive than ill-structured, it was difficult to determine the level of creativity and critical thinking that was really offered in the lesson (Brush, 2017; Thomas, 2000). By providing students the options for the task, a lot of the creativity is withdrawn from the process. Although the task itself may contain some elements of creativity, by allowing students to create their own tasks, the learning process truly seeks and supports the deep levels of creativity within a PBL structure. The critical thinking element of PBL instruction largely stems from the fact that students are seeking an answer to a problem that does not have a clear answer. There are always ways to question, rethink, and redecide in their process, thus promoting critical thinking. Participants seemed to associate critical thinking with included questions on the attached lessons they uploaded.

The participants, overall, had elements of collaboration. Within their aspects of collaboration, there were multiple outlets for students to communicate. Participants indicated activities such as group discussions, debates, and presentations as ways students not only collaborated but communicated their ideas. Many participants also added that students worked together and shared their ideas, adding to an understanding of PBL best practice. Overall, participants demonstrated their understanding of the importance of collaboration within a PBL task. For example, teachers discussed peer tutoring and collaboration and small group

discussions, and thus students practiced communication within these collaborative activities.

Although many participants mentioned the difficulty of effective communication, it is clear they knew that communication and collaboration was an important part of the problem-based learning process.

There was a large disconnect between the ill-structured description and the actual design of the lesson plan. Although teachers generally described having a student-driven classroom filled with flexibility and choice, the actual plans largely reflected the opposite. The prescriptive tasks directly contrast the ill-structured nature described previously for RQ1. Two participants had the beginnings of an ill-structured task, but it was not completely ill-structured and, with some minor modifications, could align with PBL design. The plans provided by the teacher participants were mostly the opposite of ill-structured and provided specific tasks, questions, and intended outcomes (Brush, 2017; Thomas, 2000). Many of the participants uploaded plans that contained specific directions, specific checkpoints and largely supported students to produce very similar end products. The choice and flexibility the teachers described were within many of their PBL sections, as in, within a section, they gave multiple options to complete instead of allowing students the freedom to determine their own option. Overall, even though the participants felt they were allowing choice and freedom, there is still a lot of room for growth to support a truly student-driven classroom and essentially the maximum benefits of problem-based instruction.

The real-world component of the lesson plans was not strongly present within the participants' plans. Although teacher participants described problem-based tasks accurately, stating students solve a real-life problem, four of the participants lacked a problem statement at all in the implementation. In addition to the ill-structured nature, many participants referenced a

PBL should be relatable to students. However, only two participants demonstrated a real-world element of the task design, again contrasting with their initial description (Brush, 2017; Thomas, 2000). Although initially described as student-driven in student-driven participants' lessons did not reflect the student-driven model in their descriptions and lacked elements of student freedom and choice. Two participants were able to recognize this missing factor within their reflection. However, many assumed their PBL was aligned to best practice.

In terms of understanding their roles as referenced in RQ2, there seems to be a descriptive understanding, but the implementation of the PBL task among participants is very teacher-driven. Only one participant seems to demonstrate an understanding of the role when looking at implementation. This teacher participant did not attach plans because she stated the students each created their own real-world problem. The lack of including the plan itself actually speaks to how ill-structured and student-led this participant-led her class. Although teacher participants clearly defined their role as a facilitator, many plans included specific questions and tasks, thus, contrasted with the described facilitation role. Although most of the participants indicated what ill-structure was within a problem-based task, many did not have that evidence of this ill-structured format within their lesson plan (Brush, 2017; Thomas, 2000).

There is a clear, descriptive understanding from all the participants on problem-based learning on a surface level. Some participants demonstrated deeper levels of understanding through their lesson plan or reflection; however, there is still a clear disconnect between descriptions and implementation. There is a large discrepancy between descriptively what ill-structured means and how it looks when implemented into a classroom (Brush, 2017; Thomas, 2000). A real-world, relatable problem statement also lacked in the implementation among participants. Although teacher participants described a teacher facilitation and student-driven

model, the plans reflected a teacher-driven task. Overall, teachers understand PBL on a descriptive level, but taking those descriptions and implementing them into the classroom have not connected.

Discussion

In this section, findings will be explored in light of research best practices for PBL design and teacher role. The beliefs section will discuss the findings of teacher participants' descriptions of task design and discuss their alignment with the importance of collaboration in PBL. A divergence from best practice research includes descriptions of real-world, relatable problem statements and student choice. The section will further explore the findings in relation to Action Theory Framework, specifically discussing how governing values play a role in teachers' choices within a PBL task and how the findings diverge from the ideal PBL scenario. Lastly, the section will further discuss teachers' perceptions and descriptions of design and role in relation to the challenges teacher participants faced when implementing their tasks and how this aligns with PBL research.

Action Theory: What Theory Says and What Was Observed

Action Theory Framework focuses on taking perceptions and beliefs and turning them into practice. Action Theory divides into two main elements, including espoused theory and theory in use. Theory in use further divides into two main subsections, including governing values and action strategy. In order to further develop an understanding of teacher participants' choices, a deeper look into governing values may help shed light on teachers' perceptions.

Governing values represent a core group of behaviors that influence or drive human behavior. These governing values include goal setting, winning or losing, suppressing negativity, or rationality. If the initial governing values do not support PBL instruction, theoretically, these

values will affect the effort and dedication of PBL implementation. When looking at the governing value of goal setting, an ideal situation includes PBL as the main curricular focus. However, if PBL is not the main goal or driving force of the instruction, naturally, it will take less of the teachers' focus, thus affecting implementation. Winning or losing connects to the idea that decisions made in situations people think they can "win" will be different than in situations think they will lose. In an ideal PBL experience, the winning scenario would be a well-structured PBL in combination with constructive collaboration from the students. Without seeing these positive outcomes, this would connect with a "losing" value, leading to teachers naturally questioning using the PBL again in the classroom. This losing value will directly connect with the next governing value of suppressing negativity. If the previous implementation of PBL had minimal positive outcomes, teachers might feel negative towards implementing a PBL into their classroom again. These negative consequences only further push teachers away from effective implementation. Lastly, rationality could play a role in the implementation process. In an ideal scenario, it makes sense to implement PBL, given its wide range of positive outcomes not only on students socially but also academically. However, if teachers have not had positive interactions with PBL, as seen with many teacher participants in the findings, teachers would begin to question if it is even rational to implement it at all. These governing values will all, theoretically, contribute to how teacher participants make choices for implementation in the classroom and may influence the dedication behind the implementation.

Governing values will then affect the action strategy. Action strategies are a series of actions in different situations that satisfy the governing values (Dick & Dalmau, 2000). Action strategy, then, may be viewed as the series of choices teachers make in the classroom when implementing the problem-based learning task. By examining those small choices, the extent to

which they line up with teachers' governing value or their initial perception of what they considered to be PBL best practice may be examined (Argyris & Schon, 1976).

Consider the charts below for an ideal representation of PBL implementation and one based on the teacher participant findings. Figure 1 represents the ideal PBL scenario. In Figure 2, the governing values are now representing different feelings or thoughts from teacher participants and how these governing values would directly affect the implementation of the PBL in the classroom.

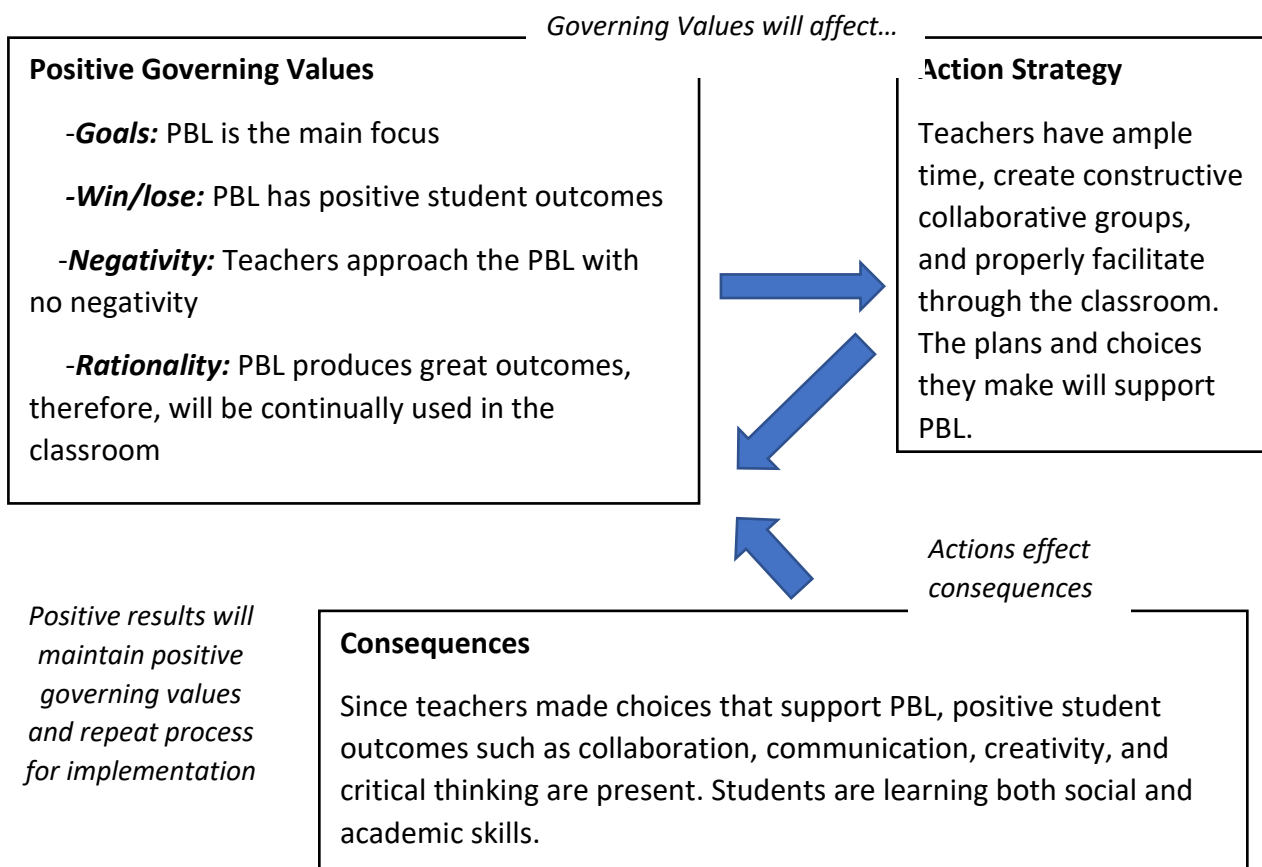


Figure 2. Theory in use: The ideal PBL scenario. Theoretical concepts used were adapted from Argyris & Schon, 1976.

Now consider the same process represented in Figure 3 with teacher participant findings from the study.

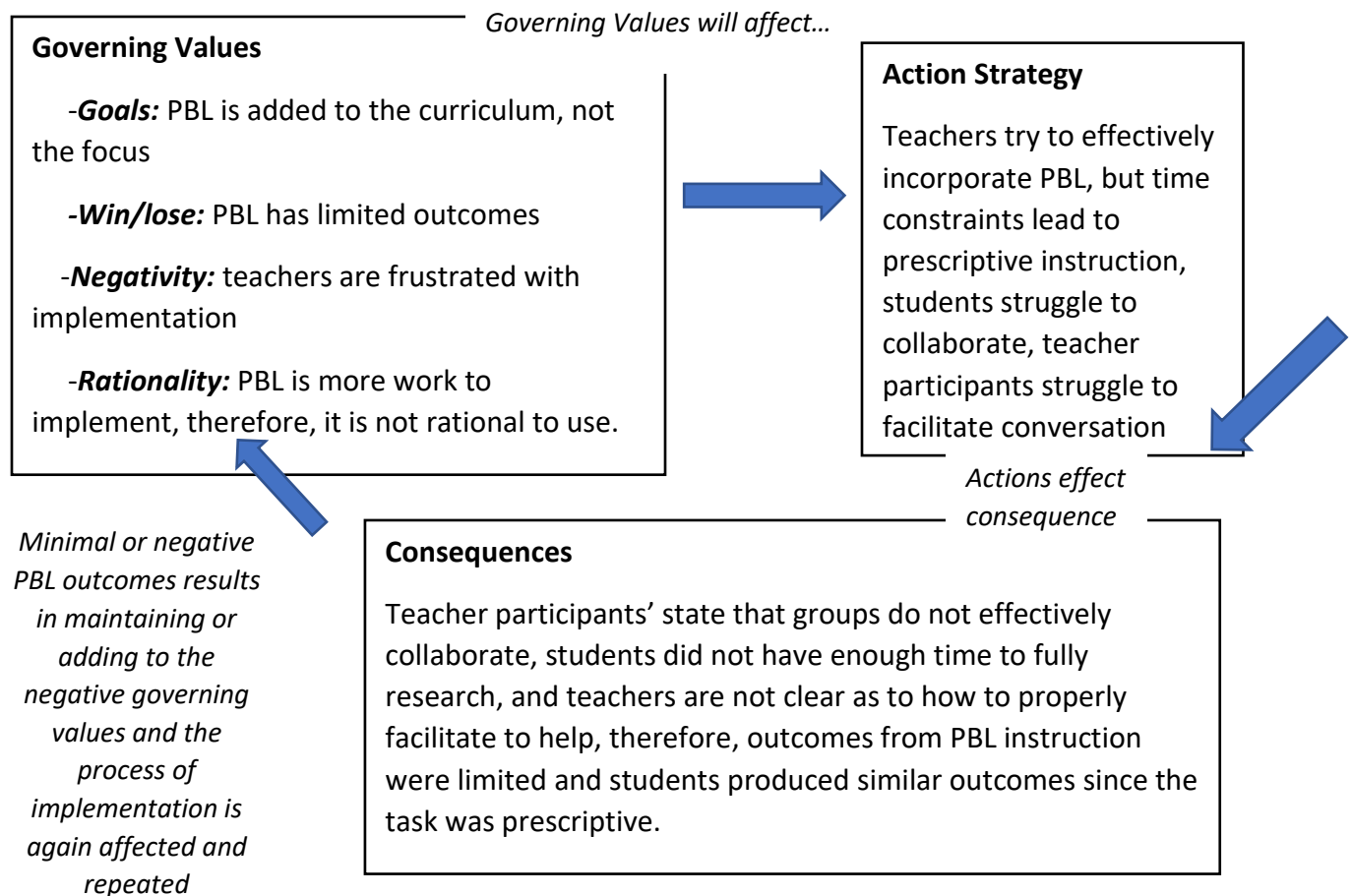


Figure 3. Theory in use: The participants' findings. Theoretical concepts used were adapted from Argyris & Schon, 1976.

There are many differences between beliefs and described PBL practice. In theory, a problem-based learning task will be the focal point of the curriculum, driving the core elements of instruction and providing students an ample amount of time to explore the topic. A PBL should incorporate not only a real-world problem but also a problem that students relate to, creating a passion for learning, keeping students motivated throughout the PBL task. However,

in the described practice, teacher participants describe PBL as an added task, resulting in teacher participants struggling to find the time to let students explore their topic. Teacher participants also did not have real-world, relatable topics (Brush, 2017; Kumar & Kogurt, 2006; Strobel, 2009; Wilder, 2015). An ideal PBL task is ill-structured, allowing students to take any avenue of their choice to demonstrate their personal approaches to solving the proposed problem, highlighting a process of discovery and learning finding multiple solutions to solving the problem (Brush, 2017; Thomas, 2000; Torp & Sage, 2002). The participants described tasks, including structure, directions, and clear intended outcomes. Ideally, in a PBL task, students combine their research and collaborate to discover the best options to solving the problem by engaging in thoughtful discussion, working through best options, and incorporating all thoughts and opinions of the group members to derive the best solution (Saptura, 2019; Wilder, 2015). Teachers provide an added layer of guidance, encouraging students to explore these topics and support their independence in their research, providing thought-provoking questions, driving students into a deeper dive of the topic (Belland et al., 2006; Dolman et al., 2005; Kumar & Kogurt, 2006). Teacher participants describe a different experience explaining the difficulty of students working together and the challenge of helping them navigate through those problems.

In conclusion, a PBL task should follow the ideal format and produce the desired outcomes. However, the findings deviate from the ideal PBL scenario, and therefore, produce less of the desired outcomes. From the lens of action theory, governing values play an important role in the choices teacher participants make within their classrooms, all contributing to whether or not these desired outcomes are present at the end of the PBL task. If these outcomes are not present, and teachers found many frustrations within the process, these negative feelings may theoretically influence the choices made when implementing the next PBL task in the classroom.

Teachers' Perceptions of PBL Design

There are many facets to a well-constructed problem-based learning task design. However, these components can be simplified into three key elements a real-world problem statement, a collaborative investigation, and a synthesis of student ideas to address the problem (Kumar & Kogurt, 2006; Mergendoller, 2018; Thomas, 2000; Torp & Sage, 2000). When addressing the findings of the study, some participants did not have a connection to the real-world problem. This real-world element was particularly missing within the two veteran participants' plans, demonstrating that experience level did not link with understanding. Some participants showed elements of a real-world problem but not a full understanding. However, even those participants that demonstrated a real-world problem connection did not fully explore what that real-world element really entails. "Real-world" should really mean real in their world, as in relatable to the students. In addition, the problem should be a real concern, and not one made up for the PBL (Thomas, 2000). Some participants touched upon this concept for the real-world problem statement. Some even directly mentioned, it should pertain to the community for the students. However, within many of the plans, there was no clear problem statement at all. Selecting a problem statement is a key detail in the PBL task, requiring a real-world component, an emotional connection for students, and a driving force in the curriculum. However, even though participants identified that a problem-based task has a problem, four of the participants do not have a problem clearly stated on the PBL task, including the two participants with the most teaching experience (Belland et al., 2006; Kumar & Kogurt, 2006; Thomas, 2000; Torp & Sage, 2000).

In addition to the construction of a relatable real-world problem statement, PBL's should also include the curriculum. Essentially, the PBL should be the central teaching component of

the curriculum (Thomas, 2000; Walker, 2015). However, it seems based on the teacher participants' explanations and lesson plans. These PBLs were not a central focus of core instruction, but instead an added activity. A PBL is not a project assigned after traditional instruction. The traditional methods of lecture and note-taking no longer exist, and PBL has replaced that element of the traditional classroom (Brush, 2017; Kumar & Kogurt, 2006; Mergendoller, n.d.; Thomas, 2000; Torp & Sage, 2002). When looking at the teacher participants, it seems that only one used PBL as the main and core instructional focus, stating that the lessons in her classroom are run like this every day, and students create their own problems for research. Another participant mentioned the PBL supported the marking period theme; however, most of the participants did not seem to have a clear relatable question that helped teach the curriculum.

Research suggests that constructive collaboration is a core element of an effective PBL. During a constructive collaborative process, students begin by generating what they already know about the presented problem. Next, students identify gaps in the research and focus their research on those gaps. From there, students combine all this knowledge and create a solution to the problem. The word "constructive" is key to this distinction. Constructive means all students are actively engaged and participating, which was not always the case, as stated by the teacher participants. When referencing constructive collaboration in research, it also states students should take the initial knowledge and transform it into new skills and understandings, resulting in a high level of student engagement since they are creating their own gaps in knowledge (Belland et al., 2006; Dolman et al., 2005; Kumar & Kogurt, 2006). All of the teacher participants indicated some level of collaboration, but it seems there is little constructive collaboration happening during the implementation process. Many teacher participants voiced

concern on how the students were frustrated with the process by stating their frustration with group work, mentioning the difficulty of students not working together or trying to take charge. It is clear although teacher participants know collaboration is a core element, there is a constructive piece missing from the collaborative approach in the classroom, which may need more focus to be taught.

It is within this constructive collaborative setting teachers act as the facilitator by ensuring students stay on task, pointing them in the right direction, and possibly providing information to fill these gaps. Student-driven or student autonomy, as defined by Thomas (2000), states that students make the majority of the decisions within the PBL task. The task itself has no specific directions or pre-determined outcomes. Students have full choice, unsupervised work time, and responsibility (Belland et al., 2006; Dolman et al., 2005; Kumar & Kogurt, 2006). Although teacher participants expressed that a key component to PBL was allowing students choice, many still provided minimal choices in their lesson plan. In addition, the tasks included by most teacher participants had very clear directions, rubrics, and specific outcomes. Most participants' lessons do not correlate to the research-based description; all contained specific requirements and directions.

The last key element of problem-based learning is students synthesizing ideas to generate a solution. Prior knowledge, collaborated knowledge, and researched knowledge is all brought together to create a solution to the initially presented problem. During this process is when those key 21st-century skills emerge, such as communication, collaboration, creativity, and critical thinking (Brush, 2017; Kumar & Kogurt, 2006; Mergendoller, n.d.; Thomas, 2000; Torp & Sage, 2002). Many of the included lesson plans had elements of these core outcomes, but many of the teacher participants were missing some of these outcomes in both their descriptions and their

tasks. Even though some of the activities themselves may provide some of the outcomes, the prescriptive nature in how they were delivered detracts from the PBL process. The process of students figuring out their own route is part of what creates critical thinking and creativity skills.

Teacher Perceptions of Role in Problem-Based Learning

In order for teachers to be able to properly facilitate, they need to develop a strong set of scaffolding skills. Scaffolding is something most teachers may be familiar with; however, scaffolding in a PBL centered classroom can be very different from a traditional classroom due to the cross-curricular nature of the task. Teachers are no longer just scaffold for their decided subject but must be prepared to scaffold across all disciplines (Brush, 2017). This means teachers not only need to know the design of a PBL but how to multi-subject scaffold. In order for this to work, teachers themselves also need a general base of cross-curricular knowledge. Within the study, one participant mentioned in order to improve the PBL for the next time, she would incorporate more differentiation and scaffolding. However, many participants did not have any clear methods to change the outcomes for the next PBL implementation, including participants with the most teaching experience. Focusing on scaffolding techniques may provide a targeted path to help teachers more effectively facilitate, which multiple teacher participants indicated they struggled with when utilizing the PBL.

In addition, modifications per the class of students also need to be considered (Thomas, 2000). This is a key element in the facilitation process; if teachers provide guidance that doesn't actually drive the students forward with a self-inquiry process, the PBL process won't be effective. Facilitation needs to produce positive outcomes that motivate students to drive the learning; the questions from the teachers need to be probing them to do so. These needs can change from class to class. This process can be challenging even for a veteran teacher. This is

evident with two veteran teacher participants from the study, both missing key PBL elements in their plans. One participant with over 20 years of teaching experience presented a task that was the most misaligned with PBL best practice out of the six participants. She was also unable to recognize any of the misalignment within the reflection portion of the study. Another participant with over 20 years of experience clearly states her struggle with facilitating within the classroom. She indicates when students get stuck, it leads her back to prescriptive measures and leaves her frustrated. However, she did not indicate any need for further professional development in terms of facilitation (Dolmans et al., 2005; Kumar & Kogurt, 2006; Thomas, 2000). Research has shown that teachers consistently report feeling inadequate in the implementation process and question their facilitation skills, which is also evident from the teacher participants in the study, most stating the difficulty of facilitation. However, other teacher participants may not even realize that they may need assistance with facilitation (Lunyk-Child, 2001).

An added factor that makes learning facilitation more difficult is that most classroom teachers were not taught in this manner themselves, thus making it more difficult to break that traditional learning style, making it especially difficult for veteran teachers. This may also be true for the teacher participants of the study. Also, teachers may be providing guidance to problems that may not have a particular solution, thus making it more challenging to facilitate. This notion could also contribute to the difficulty of facilitation teacher participants described (Brush, 2017; Torp & Sage, 2002). Teachers themselves may need to make their own inquiries into the problem before being able to successfully facilitate. However, few teacher participants indicated this preparatory time within the survey results as a method for improvement going forward (Torp & Sage, 2002).

Summary of Discussion

In general, findings complemented prior scholarship because teacher participants held core beliefs that would, theoretically, support PBL instruction. Teacher participants specifically noted the importance of student collaboration within a PBL task, which is key in PBL research and the main component of how PBL differs from traditional instruction. Although teacher participants noted this importance, during the actual PBL implementation, they struggled to implement constructive collaboration within the classroom, a key element in making collaboration effective. Choices teachers made in their PBL tasks diverged from the initial description provided. In addition, teacher participants also noted many specific elements of PBL instruction, including student choice and teacher facilitation also aligned to research best practices. However, many of the choices made within the PBL task design reflected a more teacher-centered approach. Teacher participants highlighted the element of choice, but their concept of what “choice” looked like in a PBL task greatly diverged from PBL research. Although some of the participants briefly mention elements of real-world or relatability, the findings generally diverged from these concepts with the included PBL tasks.

Action theory provided a lens for us to develop a deeper understanding of teachers’ perceptions by taking a closer look at the process they have described when implementing their tasks. According to action theory, governing values will have a large impact on the choices a person makes. In an ideal PBL scenario, then, we may assume that teachers who have a positive view of PBL and use it as the central teaching method in their classroom have sufficient time to effectively design and implement the PBL task. Under these conditions, it would follow that PBL’s research-identified positive social and academic outcomes for students would be realized. However, teacher participants shared findings that deviated from these ideal scenarios, sharing implementation concerns including timing, student collaboration, and facilitation efforts.

Theoretically, these concerns may be influencing their governing values and the choices they make to implement PBL in the future.

Implication for Policy

In order for problem-based instruction to be truly effective, support for effective implementation needs to be in place. If schools want to incorporate PBL and see positive outcomes from it, they must first make changes to school curricula that are in full support of problem-based tasks, beginning with making it a central focus of the curriculum. Once the curriculum is PBL centered, this will allow ample time for students to fully explore the problem statement and, thus, develop those key learning skills within the research process. Within the study, most participants indicated time was an issue when implementing their tasks, indicating if they had more time for students to research, they would allow more exploration instead of providing specific directions. This aspect makes a key difference in student learning. If teachers are trying to incorporate district and state mandates in addition to a problem-based learning task, it will be ineffective. The district must put in place PBL tasks that support state learning mandates and allow teachers to fully implement and support PBL in their classroom. Without the proper amount of time for students to research, the work will be overwhelming and frustrating for both the students and the teacher (Kumar & Kogurt, 2006; Thomas, 2000).

In order for a district to truly incorporate PBL, the district may need to take a closer look at the mandates for teacher lesson plan submission. Districts usually provide a template with very specific goals, time frames, and objectives that pertain to the day's lesson. Depending on how the districts organize lesson planning, it may need to be changed to be more PBL supportive. The specifics of lessons are not needed when planning a PBL; a revamp in planning

may be necessary to properly prepare teachers. This ensures that every element of the problem-based task is not planned out in order to leave it ill-structured and promote multiple student responses (Brush, 2017; Thomas, 2000). Instead of being so focused on lesson planning specifics, in a PB- centered classroom, it may be more valuable for teachers to spend the planning time enriching their own knowledge on the topic in order to help effectively facilitate a cross curricular problem-based task (Thomas, 2000).

In addition, for a school to truly implement problem-based learning, the traditional grading scale may need to be revisited and changed to support PBL. In a problem-based task, the process is important, meaning “wrong” answers are just as valuable because students must research, and the reason why an answer may be right or wrong. In addition, if a problem is well constructed, there won’t be a correct answer, but well-researched plans of action. This directly contrasts traditional grading, where there is frequently one correct answer. Districts may need to come up with a different way of grading that focuses on effort, collaboration, and staying on task as opposed to an outcome that highlights specific answers.

Lastly, if schools are to make changes to support PBL in terms of lesson plans and grading, all of these changes need to be effectively conveyed to the teachers. To truly make an impact with problem-based learning instruction, teacher training must be offered consistently throughout the years at various levels and topics, including but not limited to student collaborative elements, class management, policy changes, PBL creation, and differentiation to help support teachers throughout the process (Kumar & Kogurt, 2006; Lunyk-Child, 2001; Thomas, 2000).

Implications for Practice

The findings and discussion have four key implications for practice, including PBL creation, facilitation training, problem vs. project-based learning clarity, and strategies to support effective collaboration. This section will describe these implications in further detail.

The first implication suggests teachers may need to learn more about problem-based learning design, focusing specifically on well-constructed problem statements. To accomplish this, specific training on what problem statements should include could be an effective strategy to help inform teachers and improve their PBL practice. Such training could discuss specific details that teachers should consider when creating problem statements, including curricular focus, ill-structured format, subject, and relatability to the students (Brush, 2017; Thomas, 2000). One participant clearly states the need for additional trainings. However, as evidenced by the submitted PBL lesson plans, many participants would benefit from district PBL training, although it was not directly stated by the other participants. Teachers should be aware of the curricular mandates and use these mandates to formulate a problem that will connect to the instruction for that particular unit or semester. It may also be helpful to provide teachers more specific guidelines as to what is considered an ill-structured format, including guidance on how specific teachers should be with rubrics, timelines, and included directions (Brush, 2017; Thomas, 2000). Although some teachers indicate their problem-based learning knowledge stems from college and one participant indicates her knowledge was from a different district, having specific training on a district level will help teachers properly implement PBL in support of the specific school's curriculum. Teachers should be provided exemplars of PBL design to show examples of effective ill-structured problem statements (Brush, 2017; Thomas, 2000). In addition, examples should be provided on problem statements that address a societal issue, which may provide more guidance to educators in the language arts and social studies subject areas.

Lastly, a problem statement should be realistic and relatable to the student body. This may mean guiding teachers to consider community, state, or national factors to which students may be able to relate, but that are also current problems. If the problem is not realistic or relatable, then it is difficult for students to extract meaning (Dolmans et al., 2005, p. 734). Creating an effective problem statement is a core element of PBL instruction. By providing teachers more constructive clear guidelines as to what to consider and include within a problem statement may help teachers address issues with alignment and development, and thus, could help students make more constructive connections to the PBL tasks, thus influencing implementation success.

The next implication for practice is training on teacher facilitation, suggesting that teachers may need to learn more about what facilitation may look like in a classroom and what specific actions they can take to help promote student learning. However, more specifically, teachers may need more guidance on strategies they can use when they encounter conflict in the classroom. This can be accomplished by districts targeting the facilitation element of problem-based instruction for further in-depth training to help teachers fully develop skills as a successful facilitator. This includes ensuring all levels of teachers, including future, novice, and veteran teachers, receive training pertaining to their skill level and needs. Training should highlight the importance of redefining their roles in the classrooms and providing teachers strategies to help students work through frustrations. Teachers can guide students through these challenges by utilizing elements of facilitation such as diagnosing, mentoring, questioning, modeling, utilizing role & drama, managing group work, and monitoring engagement (Torp & Sage, 2002). Additional training on these specific forms of facilitation may help teachers see a clearer path to drive the instruction forward.

In order to effectively facilitate, teachers may also need to learn more about scaffolding and how to use it within their classrooms. Due to the nature of the PBL, teachers will not be able to visualize a specific student outcome and need to be open to allowing all students to arrive at their own solution, emphasizing the learning in the actual process as opposed to the product. To do this effectively, teachers need a strong set of scaffolding skills since different students, groups, and classes may all have different needs in terms of facilitating (Dolmans & Grave, 2005; Lunyk-Child, 2001; Thomas, 2000). To help teachers learn how to scaffold, districts can provide specific training targeting types of scaffolding and their effectiveness. Scaffolding can be seen in two forms: a hard scaffold and a soft scaffold. A hard scaffold can be planned in advance, such as having a graphic organizer available for students, while a soft scaffold would be required at the moment while working with students and may need some extra considerations to develop effectively (Brush, 2017).

In order to scaffold effectively, teachers also need a wide base of cross-curricular knowledge to appropriately guide and assist their students (Thomas, 2000). A teacher sets the tone for the problem-based assessment in the classroom, which includes exhibiting a positive attitude with encouraging motivation. The support from teachers in the facilitation process is just as important as scaffolding, allowing students to pose questions and potentially get things “wrong.” Teachers are there to also help students see the value in the process and help them continue forward. Students may generate multiple solutions. The process of eliminating them is just as valuable as finding one that works. Teachers can guide this thought process to the solution they feel may be the most effective. Teachers can accomplish this by learning to shift their perspective from a traditional teacher perspective to more of a coach or partner during the PBL process. The teacher may also not have an answer, and in turn, may need to conduct their own

research before instruction to help guide students (Brush, 2017; Torp & Sage, 2002; Wilder, 2015).

The next implication for practice is the need to clarify the differences between problem and project-based learning, especially in a K-12 educational setting (Brush, 2017). To accomplish this, a district can provide training to clarify the differences between the two and when each type of task is appropriate in the classroom. Project-based learning is a broad, far-reaching term that can vary in meaning and outcomes, incorporating a wide range of pedagogies. Project-based learning does not have a strong connection to positive student outcomes like problem-based learning tasks (Brush, 2017; Hanney, 2013). Project-based learning tasks are distinct in their learning approach and provide specific approaches to student engagement and learning outcomes (Brush, 2017). Although similar in some areas, such as student choice, problem, and project-based instruction are very different, but they are commonly confused (Bedard et al., 2012). The subject matter may play a role in this confusion, given that social studies and language arts don't always pose a problem as clearly as subjects like math and science and tend to be, in general, more project-based. In addition, research in problem-based learning leans heavily on the emphasis of science, social studies, engineering, and math, thus providing less guidance on the other subjects. Therefore, a district clarifying these tasks may prove to be helpful to effective implementation (Brush, 2017; Thomas, 2000).

More knowledge of the differences between these two tasks may help teachers refine their PBL designs and can be accomplished by providing specific training on these tasks. Problem-based learning is a fairly new method in teaching, whereas projects have always been utilized in the classroom. A key difference between the two is the concept of centrality. A problem-based task will be the curriculum, meaning the core lesson and all the activities that

come with it. A project-based activity is an add on to a lesson to produce a certain product. A project-based task is to demonstrate an understanding of a part of the curriculum and is not meant to be the central teaching element (Thomas, 2000). The two models produce different end results. Project-based learning produces a project, many times a similar project to each other. The goal of a problem-based task is a solution to a real-life problem, and the solutions will all be very different depending on the student group. The overlap that tends to cause this confusion is both tasks focus on student choice and teacher facilitation, but the purpose of each is very different, thus making it even more effective to provide training on these two methods (Milman & Kilbane, 2017).

The last implication for practice is supporting effective collaboration. Teachers may need to learn more about what effective collaboration may look like in a classroom. Identifying that students need to collaborate effectively is way easier than implementing the concept into the classroom. This can be accomplished by providing guidance on how to teach some primer skills to students that will help implement constructive collaboration. Students need to learn basic communication skills to work effectively with each other in a group. Students also need to learn how to delegate properly and bring together various pieces of the task into a whole. This may take practice and some smaller activities to learn, especially at a middle school level. If students lack the social skills needed to have meaningful conversations with their peers, the PBL will not be effective (Dolmans & Grave, 2005; Thomas, 2000).

Implications for Research

The study found that problem-based learning has been found to have many positive outcomes for students (Brush, 2017; Loyens, 2008; Saputra, 2019), yet in the context of social studies and language arts, little research has been conducted as to how to effectively incorporate

these subjects into PBL centered classrooms to achieve these positive outcomes. These subjects were chosen because the nature of a PBL task is cross-curricular, so the inclusion of these subjects should be a valuable aspect to student learning, incorporating skills that are heavily focused on reading, writing, expression, and analyzing research. Having a strong base in these skills will help students be able to properly work through difficult sources. Thus, this study may be used as an initial case to be included in future multi-case studies. This study focused on teachers' perceptions. Future research may also focus more on these subjects within problem-based learning and contribute more research towards its' impact on student learning in these content areas. Future researchers can also focus on the grade level. There is limited research on grades 6-8 for problem-based instruction. Young elementary, high school, college, and graduate levels have a large portion of the research. However, this in-between level may provide valuable skills students can use as they reach these higher levels of education. The age level may require more care in primer skills since it is such a transitional level of education.

The study consisted of three data sources, in which teacher participants shared their perceptions and understandings. Since there was a limited amount of information teachers shared within the study, future studies can implement follow up questions to generate more information from the participants and clarify any general statements made from the first round of data collection. In addition, the study was conducted in a limited time frame. The data were collected in a 1-month time frame at the end of the school year. Future studies could collect data periodically throughout the school year and gather teacher perceptions on more than one PBL task throughout the year, thus increasing the time spent with data collection. In addition, the study did not go into detail about state policy, time constraints, or resource availability. Future studies could fully explore specific policies, thus getting a better sense of how state policies

influence the PBL curriculum in schools. Future research could also focus on time constraints and resource availability and how these aspects influence PBL implementation.

Qualitative research supports the collection of documents within a case study. One document collected in this study was the lesson plan (Baxter & Jack, 2008; Yin, 2009). Further research could also be conducted on the lesson plan collection since most teachers included a PBL task instead of a lesson plan; future studies could collect both documents to see how teachers plan a lesson and the corresponding PBL task, thus displaying how they take their understandings and plan them into practice. However, future studies could also include student work as part of a document collection, showing how student work is associated with teaching practice.

The study focused on a small pool of six participants. The study does not provide information on a widescale group of teachers. The study is transferable to other studies with a similar context; however, future studies could use a bigger sample pool to generate more data, which in turn, may be more applicable to a widescale group of teachers. In addition, future studies could focus the participants on a specific gender and further explore problem-based learning beliefs in relation to gender. Future studies could also focus the participants based on their experience levels, delving deeper into the beliefs of teachers who are novices or veterans and how their experience levels influence their problem-based learning perceptions and understandings.

The district and corresponding curriculum of the district greatly influence teachers and the choices they make with PBL in their classrooms. To ensure PBL is most effective, it must be the central focus of the curriculum (Brush, 2017; Thomas, 2000; Walker, 2015). Future research can also explore how to ensure PBL is integrated into the curriculum and not added to support

effective implementation. More research could also focus on how districts present PBL to their teachers and how teachers take these presentations and plan them into practice. Additional research could also be conducted on how districts support their teachers with PBL instruction. This could include research on how districts could better support teachers becoming effective facilitators. It could explore how districts could support teachers to help them facilitate better student collaboration. Lastly, research could explore teachers' perceptions of self-reflective practice and self-assessment in PBL practice. The study included a reflection in which some teachers were able to identify and reflect on their practice and make useful suggestions on how to influence future PBL in a positive way.

Assumptions and Delimitations

Numerous assumptions were made at the beginning of the study, which included that participants teach under similar PBL mandated policies. Due to the differences between curricular mandates and policies between districts, the findings demonstrated that all teachers used PBL in the classroom, but the tasks shared for the study varied in alignment with PBL best practice research. Because this study did not include district curriculum analysis, it is unclear if these results were related to the comprehensiveness of each district's PBL structures within their curriculum. In other words, the data collection does not tell us how well PBL is developed within the specific school's curriculum. Additionally, the findings show us teachers have a clear understanding of PBL, but it does not shed light if this understanding is based on the comprehension of a district curriculum or if it was just their personal understandings from past experiences. There is an assumption since these districts include PBL. The teachers will know at least something about PBL; the findings did indicate that many teacher participants had knowledge of PBL from different sources, including prior districts or colleges. Many participants

did not reference their district as the main source of information. Even if the participant is from a district that mandates PBL and fits the sample criteria, the findings are not transferable if the teacher has not heard of PBL or does not know anything about PBL. Findings may also not be used to evaluate the extent to which practice is related to the existing curricular expectations.

The study has a narrow pool of participants and can be transferable to other studies with the same criteria. The sample criteria focused on NJ, Title I, urban schools. The findings may be applicable in other states outside of New Jersey but will not be applicable to districts that are not Title I in urban locations. The urban context and Title I criteria were specifically selected for the sample because research indicated these contexts might yield positive PBL outcomes; the application of the study to more affluent districts would change the context of the study and no longer be transferable. The study also focused on teachers within a middle school grade level since it is an understudied area of PBL instruction. The findings could be transferable to other studies that focus on this particular grade level, regardless of the location. Lastly, the study focused on language arts and social studies because PBL tends to lean so heavily on science, engineering, and math. The findings may be significantly different from teachers in these subjects because it is likely they had a higher level of exposure. Thus, in order to be transferable, the study should focus on language arts and social studies. Findings from different grade levels may also help to contribute to developing a stronger understanding of how impactful PBL is within these subjects. The study initially reached out to eleven participants; six responded, all of whom were women. Although this unexpectedly narrows the context further, it is unclear if the findings would be transferable to both genders and would require more research from a feminist lens to see if gender identities play a role in beliefs and implementation. The study only focused on teachers in urban Title I schools, further narrowing the sample criteria. However, the findings

may be relevant to other Title I schools in urban locations and transferable to other states provided the sample criteria are similar.

Similarly, there is an assumption that if the school has a curricular mandate in place that teachers know about the curriculum requirements, which may not be true. Although the study assumes that teacher participants know about the PBL policies because they used a PBL, the study does not tell us any specifics about teacher participants' knowledge of district PBL policies or whether the teacher participants are using their own PBL task. This also adds an assumption that teachers, even if aware of the PBL curricular requirements, have the proper time and resources to implement PBL into the classrooms. The findings tell us that many of the teachers did not have the resources or time to implement the PBL into their classrooms. Even teachers who felt PBL was a useful strategy expressed frustration with not having enough time to allow students to fully research topics.

When collecting data informs of the questionnaire and reflection, there is an assumption the participants will answer truthfully and fully respond to the questions. Although the findings cannot prove if teacher participants told the truth, most participants fully participated. The findings suggest that teacher participants have a solid understanding of PBL design and role descriptively but lack that understanding in their PBL tasks. The findings cannot prove if this discrepancy is authentic since teacher participants could look up generic PBL information and include it, but most findings reflected some elements of understanding in the included tasks. One participant did not attach a plan or include a reflection. Although this teacher participant seemed as though they were not initially fully participating, the description of her task project was so ill-structured there may not have been a plan to include and thus, provided valuable insight as to her perceptions of PBL (Brush, 2017; Thomas, 2000).

Limitations are also present in this study. Data collection was in the form of a survey, lesson plan, and a reflection. A limitation would be the amount of information teachers shared within the three data collection sources. The findings tell us many valuable pieces of information, but specifics on policies, time constraints, and resource availability were not fully explored. Therefore, if teacher participants provided answers that were general, it was difficult to gauge their level of understanding since the study did not provide a way to follow up with teacher responses. The time invested from each participant was also a limitation in the study. The findings demonstrated some of the teacher participants had quick short answers, while others included long, thoughtful responses. Since the time in which participants had to respond to the survey was limited, the time frame of the data collection could also be a factor in the thoroughness of the responses from participant to participant. The lesson plan collection also added an additional limitation. Most of the teacher participants included an actual PBL task instead of a formal lesson plan. Initially, a limitation was that plans might not reflect exactly what is being done in the classroom. Given that the teacher participants included an actual copy of the task, it may be more reflective of their real plan. Lesson plans may speak more generally of the task. The findings gathered more details from the attached PBL tasks, as opposed to teacher participants that included a formal plan. Finally, although all the districts include PBL as an expected professional responsibility, whether or not PBL is mandated within the districts' curriculum is unknown for the study. When considering these limitations, the findings still present valuable insight into teachers' perceptions of PBL and their tasks during implementation.

A delimitation of the study is the small sample size of six teacher participants; however, findings produced detailed data, and saturation was reached with six participants. Although the findings provided rich descriptive data, the findings do not provide information on a widescale

group of teachers fitting the sample pool. However, qualitative research aims to have transferability providing rich data that helps to understand a phenomenon. The information gathered from the data sources are transferable to other contexts that share similar characteristics as the sample criteria. The study focused on New Jersey. However, regardless of the state, problem-based learning may be occurring in the classroom. Therefore, given a similar situation, the findings may be applied across other similar scenarios (Slevin & Sines, 1999).

Conclusion

The dissertation sought to explore teachers' perceptions of problem-based learning task design and how these understandings reflect in practice. Since traditional methods may not be providing enough opportunity to develop critical skills of communication, collaboration, creativity, and critical thinking; problem-based learning may be a viable solution to help schools develop these important skills. The study's purpose is aimed to develop a deeper understanding of teachers' perceptions of task and role to see how these initial perceptions reflect in their descriptions of PBL implementation, and thus, PBL's overall effectiveness. This deeper understanding may help provide suggestions on how to further improve policy and practice in PBL learning by providing specific feedback as to what should be addressed to move forward with effective implantation. By gaining a deeper understanding of teachers' perceptions, this knowledge can help correct any misconceptions in practice and implementation, and therefore, help achieve positive student outcomes.

The findings indicated teacher participants demonstrated a general understanding of problem-based learning task design. Participants were able to describe the general elements of PBL learning, including collaboration, student choice, and cross-curricular approaches. Although some participants demonstrated an understanding of the real-world component of a PBL, there

was not enough evidence to demonstrate a full understanding. Furthermore, the relatability aspect was also not reflected in teacher perceptions. The findings also indicated that teacher participants had a clear understanding of their role within a PBL task, specifically stating their job was to facilitate by asking questions, providing resources, and helping students when they were stuck. In addition, findings also demonstrated that teacher participants had a clear understanding of the student-driven aspect of PBL instruction, stating students have a choice in their learning and work through concepts together, demonstrating passion about their learning. Although there were some essential research-based components of PBL lacking in the descriptions, overall, every teacher was able to describe a PBL task with reasonable accuracy.

The findings continued to explore teacher understandings and how these perceptions were reflected in practice. Although most teachers were able to accurately define task and role, the lesson plans presented were not in alignment with these descriptions and instead, for many participants, had a completely opposite approach. The teacher participants included plans that lacked problem statements, real-world problems, and ill-structure. The reflection provided an opportunity for participants to acknowledge this discrepancy on their own. About half of the participants identified there was a misalignment of some sort, while the other half felt their PBL was in alignment with best practices. Four major themes emerged from the data, including facilitation problems, problem vs. project-based learning confusion, student collaboration issues, and time issues, providing further information on teachers' perceptions and the choices made in their PBL lesson plan.

The findings are significant because although teachers indicated they knew how a PBL should look and theoretically how they should implement it, the actual process of how they described implementation had challenges. Teacher participants described their struggle to help

students effectively collaborate during PBL instruction. Furthermore, teacher participants seemed unclear on specific strategies to facilitate and help students navigate through these difficult areas of PBL learning. These difficulties led to teachers, including more guidance, directions, and specific expectations within their plans, thus deviating from the core elements and purpose of PBL tasks.

Insights gained through this study provide educational leaders with data that can improve policy and practice for PBL instruction. Districts should consider the curricular focus given to PBL. In addition, consideration should also be given to modifications to time, lesson plans, and grading, all of which need to be in place to properly support PBL. By utilizing the study's data, schools can begin to focus their professional development and teachers' workshops to improve PBL instruction by providing specific support to the teachers in areas of need. In the future, more research on the effects of PBL in the subject and grade level may be effective to continue to make important and positive changes to PBL implementation.

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APPENDIX A
IRB APPROVAL FORM



June 26, 2020

Christina Tighe

Re: Study ID# 2020-082 Dear Ms. Tighe,

The Research Ethics Committee of the Seton Hall University Institutional Review Board reviewed and approved your research proposal entitled “Teachers Perceptions of Problem-Based Learning Task Design and Their Understandings of Their Role in PBL Implementation” as resubmitted. This memo serves as official notice of the aforementioned study’s approval as exempt. Enclosed for your records are the stamped original Consent Form and recruitment flyer. You can make copies of these forms for your use.

The Institutional Review Board approval of your research is valid for a one-year period from the date of this letter. During this time, any changes to the research protocol, informed consent form or study team must be reviewed and approved by the IRB prior to their implementation.

You will receive a communication from the Institutional Review Board at least 1 month prior to your expiration date requesting that you submit an Annual Progress Report to keep the study active, or a Final Review of Human Subjects Research form to close the study. In all future correspondence with the Institutional Review Board, please reference the ID# listed above.

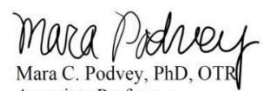
Thank you for your cooperation.

Office of the Institutional Review Board

Presidents Hall · 400 South Orange Avenue · South Orange, New Jersey 07079 · Tel: 973.275.4654 · Fax 973.275.2978 ·

www.shu.edu

Sincerely,

A handwritten signature in black ink that reads "Mara Podvey". The script is fluid and cursive, with the first name "Mara" and last name "Podvey" clearly distinguishable.

Mara C. Podvey, PhD, OTR
Associate Professor
Co-Chair, Institutional Review Board

WHAT GREAT MINDS CAN DO